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Business Staff on Page 4

T WEEK . . .

ing Aluminum on the
roduction Line

lding Gives Engineers
reat Latitude in Design

egrated Quality Control in
Precision Bearing Production

on Ore—Its Mining,
Beneficiation and Reserves—III

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 125, NO. 22 — NOVEMBER 28, 1949

NEWS

Steel Output Recovers Rapidly 27
Building Pace To Hold 27
Railroads Place Orders 29
National Tube Completing Huge Project 30
Closer Shaves: Blade and Electric Razor Sales Soar 31
Push-Button Telegraph System Saves 300 Man-Hours per Day 32
Machinery for Point Four; Will Underdeveloped Nations Accept? 33
★ Windows of Washington 34
Steel Mixes in West European Politics 37
$1.5 Billion Lost in Smog 38
Business Bright for Steel Wool Manufacturers 38
★ Calendar of Meetings 39
★ Mirrors of Motordom 41
Two Bids Submitted By American Steel & Tube for Castings Plant 44
★ Briefs 45
★ The Business Trend 47
★ Men of Industry 48
★ Obituaries 53
★ Construction and Enterprise 125

PRODUCTION-ENGINEERING

★ Production and Engineering News at a Glance 55
Furnace Bottom Installed in 57 Hours in Largest Open Hearth .. 56
★ Seen and Heard in the Machinery Field 59
How Ford Stamps Lamp Parts 60
Correctly Designed Jigs and Fixtures Can Cut Welding Costs .. 62
Lubrication Service System Pays Off in Less Machine Down Time 66
Uniformity in Finished Work Promoted by Special Machine 72
Welding Process Extended to Stainless Steel Applications 75
Design Considerations of Special Carbide Insert Holders 76
★ Progress in Steelmaking—Iron Ore—Its Mining, Beneficiation and Reserves—II 78
Perforated Cover Plates Improve Strength of Structural Columns 90
★ Letters to the Editors 92
★ New Products and Equipment 95
★ Helpful Literature 99

MARKETS

★ Market Summary 101
★ Metal Prices and Composites 102
Tin, Lead Prices Ease Further 108

★ *Advertising Index* 132

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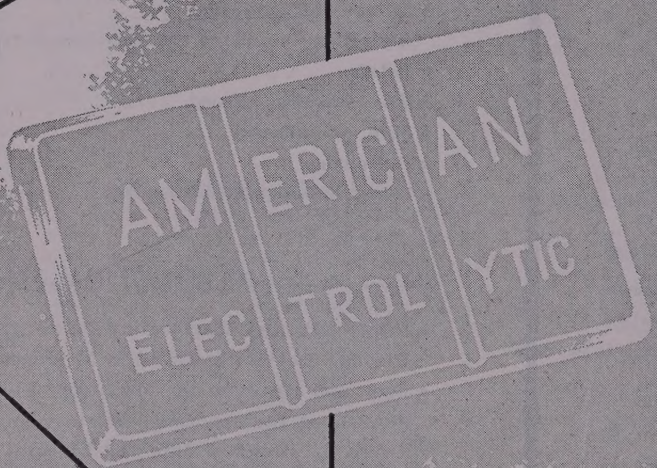

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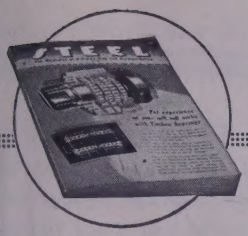

November 28, 1949

Confusion on Pensions

Now that steel output rapidly is approaching prestrike levels, many interested persons will begin to analyze the pension plans which were adopted hastily in the atmosphere of strike excitement. The more these pacts are examined critically, the more will be the disappointment.

One of the principal reasons for this disappointment is the fact that none of these plans comes even close to solving the problem of pensions. In many instances the agreements which were reached under pressure merely provide for a stop-gap arrangement whereby certain employees who will become eligible for retirement during the next five years will be assured of pensions. The plans do not make any provision for the employees who will retire after the life of the present contracts.

This means that the companies are committed to a heavy financial burden for plans which will not prove satisfactory. It means that union leaders will be forced repeatedly to push for improvements, extensions and modifications of the plans to meet the desires of employees. Perhaps it is no exaggeration to say that the entire subject of pensions, from a standpoint of national policy, is in a state of unprecedented confusion.

This confusion accentuates the problems of small companies whose managements are being pressed by unions for pension plans similar to those adopted by the primary steel producers. The confusion also points to the need of a careful restudy of the government's social security program. Somewhere along the line there must be a halt in new commitments on pensions until competent authorities can digest what has been done and prescribe a sensible policy for the future development of pensions.

Senator Robert A. Taft seems to be the first public official to sense the overall danger in the present mess. Last Tuesday he declared that the subject of pensions in industry and government is in such complete confusion that it should receive the most careful study by Congress.

Certainly the situation calls for study and clarification which will lead to sound policy before it is too late. To attempt to erect a social security system on the foundation of the makeshift plans recently adopted would be disastrous. It would be far better to start over again on a sensible basis.

* * *

HOW CUT OBSOLESCENCE?: Arthur Keating, president of Ekco Products Co., Chicago, offers a suggestion for hastening the modernization of machinery and equipment in American plants. He believes that if the United States government would offer American metalworking companies two simple inducements, a large quantity of older machinery and equipment now in use could be transferred to underdeveloped countries and put to work. The inducements would be special depreciation allowances on exported equipment and government guarantees of rental income on leased equipment.

Mr. Keating believes this program would move large quantities of used machinery to under-developed countries and would help increase American private investment abroad to $2 billion by 1952. At the same time it would accelerate the purchase of modern machines and equipment by American manufacturers.

Machine tool builders find the idea interesting, but doubt if it is practical. They point out that experience shows that most foreign coun-

(OVER)

tries want the latest models available. Few will take used equipment even on lease or as a gift.

Many machinery authorities believe the simplest way to encourage the use of modern, efficient machines is to shorten the period over which the cost of a machine is depreciated. It is unrealistic for the government to ask machine tool users to spread depreciation over 20 years when the profitable life of a new machine seldom exceeds 10 years. —p. 32

* * *

DIESELS FIND MARKET: Experience shows that sometimes it takes a long time for even the best of products to find its profitable market. A case in point is the diesel engine.

Many readers of this page will remember how the future of the diesel engine was described in glowing terms 30 or more years ago. During the intervening period it made impressive progress in the marine field and for stationary installations, but it was not until the last four or five years that it gained widespread acceptance as motive power for American railroads.

During the first ten months of 1949 the railroads put into operation 1577 new locomotives, 1524 of which were diesels. The current overwhelming shift to this type of power makes one wonder why the roads waited until John Lewis practically forced them to abandon coal.—p. 29

* * *

SALVAGING MANGANESE: It is a coincidence that a story on how the Bureau of Mines is working on a plan for recovering manganese from steel plant slag appears at the same time that E. W. Davis, in Part II of his treatise on iron ore, discusses beneficiation—particularly of Mesabi ores.

Mesabi ores have an average manganese content of between 0.6 and 0.7 per cent. Much of this manganese is going into basic open-hearth slag appearing in the form of flush slag containing about 10.8 per cent manganese. Bureau of Mines is working on the idea of converting the flush slag in a blast furnace to spiegeleisen containing 30 per cent manganese and 4 per cent phosphorus, "selective oxidation" of the manganese from this molten phospho-spiegel to produce a synthetic ore containing 55 to 60 per cent manganese low in phosphorus and finally conversion of this synthetic ore in a second blast furnace to standard 80 per cent ferromanganese.

If this scheme works, it would yield 500,000 tons of ferromanganese annually. —pp. 34, 78

KEEN RIVALRY IN STEEL: Rivalry in steel is an important factor in the problem of effecting economic unity in Western Europe. Right now it looks as if output of steel ingots and castings by the rivals in 1949 will approximate 16,575,600 net tons for Great Britain, 7,839,600 tons for France, 6,844,400 tons for Belgium and Luxemburg, and 6,159,600 tons for Western Germany. In recent months Belux production has slipped sharply, so that at the year-end the race will find Britain leading by a big margin, France and Germany neck and neck and Belux fourth.

Political factors affecting the rivalry in steel will play an important role in 1950. Nationalization of Britain's steel industry, postponed by compromise, will be decided by general elections on Feb. 23 or Mar. 2. France and Germany will use every available political advantage to improve their respective rankings in steel. —p. 37

* * *

LITTLE THINGS COUNT: In describing the efficient lubrication service system employed by Thompson Products Inc., O. M. Albl, lubrication engineer, reveals how attention to little things pays off handsomely.

At Tapco plants, the names "oiling department" and "oilers" are not used. Instead there is a "lubrication department" and there are "lubrication service men." The change has attracted a higher type of personnel, permitting a raising of standards. Cabinets, supervisors' desks and other appointments of lubrication stations are kept clean and neat. Each man has a drawer at the main station for his personal tools, such as grease gun, oil cans, tallow pots, etc.

This individual assignment of tools has cut replacement costs considerably. One man has used the same oil can and grease gun for more than five years. When equipment was used by the personnel of all three shifts nobody was interested in keeping it in first class condition.

The pay-off on attention to these little things is that down time chargeable to the lubrication department is under 0.5 per cent of production hours over a seven-year period. —p. 66

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

BUSINESS OUTLOOK— Look for at least a short-term spurt in business activity. Steel production, at 80 per cent of capacity late last week, is recovering with surprising speed and will soon equal or surpass the prestrike level of 85 per cent (p. 27). One factor sustaining the economic pace is the construction industry whose volume in 1950 is expected to equal the record $19,250 million of 1949. Coal, of course, is the perennial enigma. If Mr. Lewis orders his miners out again Dec. 1, it will be for the thirteenth time since the war.

TRANSPORTATION—Even the transportation industry, in a mild slump this year, is doing some buying (p. 29). Pennsylvania Railroad has placed a $9.5 million contract with Baldwin Locomotive Works for 91 diesel-electric locomotive units. Southern Pacific will buy 3100 new freight cars and will overhaul 900 box cars. Canadian Pacific is ordering 58 diesel-electric locomotives, to cost $12 million.

NATIONAL TUBE EXPANSION— National Tube Co. has nearly completed a three-year expansion and modernization program at its Lorain, O., works (p. 30). Major units in the U. S. Steel Corp. subsidiary's program are a continuous seamless pipe mill, new blooming, bar and billet mills, a new bessemer steel plant, 177 new by-product coke ovens and a warehouse.

SHAVING—Get a close shave this morning? Both razor blade and electric shaver manufacturers are doing their part (p. 31). Razor blade sales, at about 3 billion blades a year, are double what they were in 1939, and the volume will increase in 1950. This comes despite the inroads made by electric razor manufacturers. An estimated 9 million electric shavers are now in use, compared with perhaps 5 million a decade ago. Manufacturers see a potential market for 25 million electrics ultimately.

USED MACHINERY—If you're looking for an economical way to replace old machinery with new, this idea (p. 32) circulating in metalworking circles will be of interest: If the U. S. will allow special depreciation allowances on exported equipment and government guarantees of rental income on leased equipment, American metalworking companies can transfer older machinery to less developed countries. This would be in line with President Truman's Point Four program. Machine tool builders' reaction is skeptical. They say the idea is "logical but impossible." Similar plans were tried unsuccessfully under UNRRA and ECA.

STEEL IN EUROPE—Steel is figuring prominently in Western European politics (p. 37). A production race is forming which will exceed that of the 1920s in intensity. This thwarts hopes for economic unity. France particularly is alarmed at Germany's increasing production. In Britain, the Labor government's agreement to defer steel nationalization until after elections is seen as a major conciliatory gesture toward the Conservatives.

AUTOMOBILES— Hudson is invading a lower-price field with the 6-cylinder Pacemaker model, but it's still costlier, larger and heavier than the Ford, Chevrolet or Plymouth (p. 41). List price is $1795 for the four-door sedan, about $250 under the present six in the super series . . . New 1950 Pontiacs and Mercurys were unveiled last week, but the changes are minor.

HERE AND THERE IN INDUSTRY— America's annual loss from smog exceeds $1.5 billion (p. 38) . . . Business is bright for steel wool makers because use of the product has increased 54 per cent in a decade (p. 38) . . . The Bureau of Mines has a research project in progress to devise means to recover manganese now wasted in steel plant slag dumps (p. 34) . . . The rural area has become one of the electrical product industry's most important markets now that 78.2 per cent of the nation's farms receive central station electric service (p. 32) . . . Carnegie-Illinois Steel Corp. has completed a new telegraph center at its Chicago offices (p. 32) . . . The index of new orders and shipments of machine tools fell to 56.8 in October from 57.7 the previous month (p. 33).

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teel Output Recovers Rapidly

Although steel consumers will need several weeks before inventories are balanced again, tonnage is coming from the mills in surprising volume

OW of poststrike steel to consum- is in river-like proportions, not a trickle as originally anticipated. Although it will still take several eks for many steel users to bal- e their inventories again, steelmen surprised at the speed of the re- ery. One factor contributing to recovery has been fast repair rk.

ngot Rate Soars—Just two weeks er the bulk of the steel industry l made its truce with the steel- rkers, the ingot capacity rate was 80 per cent of capacity for the ek ended Nov. 25, a rise of 24 nts from the 56 per cent reported week before. Prior to the strike rate was 85, a level which should reached or surpassed this week. teel mill operations in the Pitts- gh district are at about prestrike els now. With most of the basic ducers in the area committed on sion and insurance agreements, naces will turn out steel during week at about an 85 per cent .

lasty Conversion? — Steel users signed up for conversion steel ause they thought there would be nortage are now wondering if they ed in haste. If there is any short- , it will probably be in the Mid- t, but even midwestern users will e a relatively easy time obtaining ets from eastern mills. The only mium will be the extra freight c. Consumers, incidentally, are ly to oppose bitterly any wide- ad price boosts.

ndicative of the general supply ation is Studebaker Corp.'s posi- . It will have to close for only n days beginning Dec. 1 because lack of steel. Studebaker, like y other consumers, began stock- g for itself and suppliers as far as last May. Despite the steel e and the company's lost pro- tion, it expects to produce 300,- 0 cars and trucks for the year, an me high.

hadow of Coal—The enigma in shadows all business prospects. e the war John L. Lewis' United e Workers have gone on strike imes. Three of the walkouts have en ended by government interven- tion or injunctions. President Tru- man says he will use injunction pro- visions of the Taft-Hartley act if an emergency develops when and if the thirteenth occurs. For temporarily defying the two government injunc- tions to date, Mr. Lewis and the UMW were fined a total of $2,130,- 000.

Building Pace To Hold

Construction in 1950 will equal the 1949 record of $19,250 mil- lion, says Commerce Department

LOOK for the total value of new construction to be put in place in 1950 to equal the 1949 record of $19,250 million.

This is the performance expected by the U. S. Commerce Department's Office of Domestic Commerce and the U. S. Labor Department's Bureau of Labor Statistics.

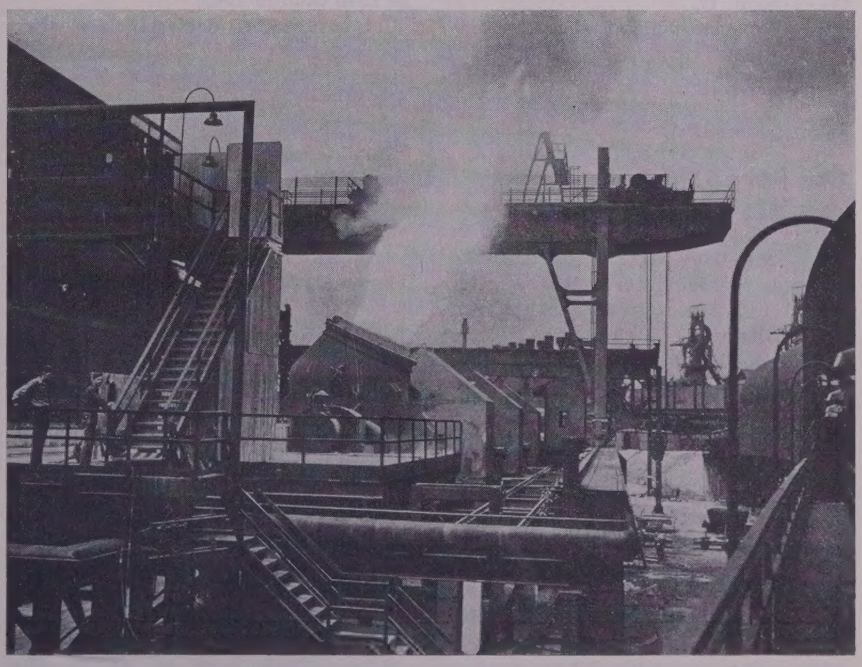
Private construction outlays prob- ably will drop about $925 million from the 1949 total but indications are that public expenditures for new construction will increase by a like amount, leaving the overall total for 1950 about the same as that for 1949. Private construction in 1950 would total $13,100 million; public construc- tion, $6,150 million.

More Commercial Buildings—Near- ly all segments of private construc- tion will be down or at least no greater than in 1949. The only ex- ceptions are expected to be: 1. Com- mercial buildings, which may increase slightly as a result of pressure for shopping facilities to serve new resi- dential areas; and 2. gas utility con- struction. New nonfarm dwelling units to be started in 1950 probably will decline to 900,000, compared with nearly a million in 1949, for indica- tions are that the higher-priced mar- ket is nearly saturated and that building costs will not decline sub- stantially, the joint report of the two bureaus says.

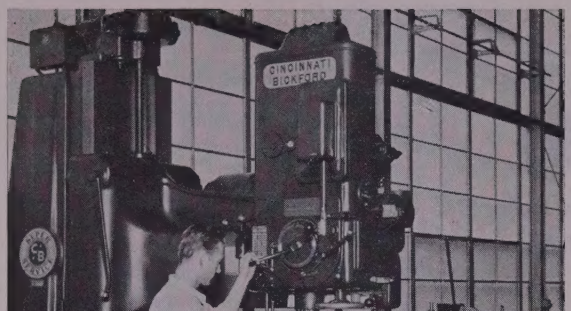
Industrial Building Down — Con- struction of new industrial plants and facilities next year is expected to drop about 26 per cent, from $975 million to $725 million, continuing the downtrend that has been so marked during 1949 as immediate postwar expansion plans were com- pleted.

In public construction every cate- gory except military and naval fa- cilities probably will be larger next year.

Construction costs, the bureaus be-



STEEL AGAIN FLOWS TO CONSUMING PLANTS
. . . as output recovers to 80 per cent of capacity



LOOK! NO JIGS: Jig precision on repetitive work—without use of jigs—is accomplished on this machine embodying units by two companies. Precision drilling machine by Cincinnati Bickford combined with Man-Au-Trol spacing table by Bullard results in coordinated assembly by which pre-determined patterns of holes can be repeated exactly. In this case three different parts are drilled and tapped at one setup. Twenty holes are involved. Savings can be made on as few as five pieces

lieve, will be relatively stable in 1950 at about the level in the latter half of 1949. Thus, with the total dollar volume expected to be unchanged, the physical volume represented in 1950 is expected to be about the same as that in 1949.

Power Shovel Outlook Good

Improved demand for commercial-size power shovels and cranes is anticipated next year, says C. B. Smythe, president of Thew Shovel Co., Lorain, O.

He believes dollar sales for the whole industry this year will be off 40 per cent from the 1948 peak. Net sales of Thew for this year will be about $20 million.

Gas Range Shipments Soar

Manufacturers' shipments of gas ranges reached an alltime high in October when 260,000 units were shipped, according to preliminary reports received by Gas Appliance Manufacturers Association.

The previous highest monthly shipments were in May, 1948, when 257,800 units were shipped, and October, 1948, with 257,500 gas ranges.

Vacuum Cleaner Sales High

October was a good month for vacuum cleaner sales. Vacuum Cleaner Manufacturers' Association reports factory sales of standard-size household units for the month were second highest of any month in 1949 and came within 3.2 per cent of the total for October, 1948. The October total was 272,520 vacuum cleaners, compared with 250,036 in September and 281,573 in October, 1948.

Sales for the first ten months of 1949 aggregate 2,367,762 units, 16.2 per cent below the corresponding 1948 total of 2,827,842. In all of 1941, the best prewar year, 1,670,129 units were sold.

More Refrigerator Dealers

Almost a thousand more dealers sold electric household refrigerators in 1949 than in 1948.

In 1949, 88,025 dealers sold electric refrigerators; in 1948, 87,066 sold them, says the National Electrical Manufacturers Association. The figures are a result of a second survey completed by NEMA's Statistical Department.

They represent all the dealers for the 12 companies included in the survey: Admiral Corp., Avco Mfg. Corp., Coolerator Co., Frigidaire Division of General Motors, General Electric Co., Gibson Refrigerator Co., Hotpoint Inc., International Harvester Co., Nash-Kelvinator Corp., Norge Division of Borg-Warner Corp., Seeger Refrigerator Co. and Westinghouse Electric Corp.

Aircraft Orders Awaited

The aircraft industry expects the Air Force to make public new contracts out of 1950 appropriations.

They were pared to about $1.4 billion by President Truman from $2 billion. There may be nearly $200 million more temporarily withheld, but there will still be $1.2 billion or more available for additional pl purchases. The Navy's program $400 million to $600 million is in dition to this amount.

Washington reports indicate t Republic Aviation Corp. may get order for its F-84E, a tactical fighter. Lockheed Aircraft Corp slated for orders for variations of basic F-80 fighter and its new F all-weather jet fighter. Other ma facturers to get contracts will North American Aviation Inc., Boe Airplane Co. and Douglas Airc Co.

Gross National Product Off

The gross national product wa an annual rate of $256 billion in third quarter of 1949, says the U Office of Business Economics.

This estimate of the market va of the nation's output of goods services is about $3.5 billion be the corresponding rate for the sec quarter and $7 billion below that the first quarter.

Despite the decline in value of tal production from the second qu ter rate, the business situation ing the third quarter was essenti stable. Total domestic demand purposes other than inventory inv ment remained firm, and mont figures indicate that declining tre evidenced earlier this year in imp tant segments of the economy w arrested or reversed in August September.

Personal consumption expenditu at an annual rate of $178.5 bil were within $500 million of the ond-quarter figure. Acquisitions durable goods, led by automob television sets and household ap ances, exceeded those of the sec quarter by $2 billion, at annual ra and consumer expenditures for s ices rose slightly. Consumption nondurable goods fell by nearly billion.

Business purchases of fixed as held firm.

Increased liquidation of business ventories in the third quarter re sented a major element of declin gross national product. The valu the reduction in stocks was $2.5 lion, at an annual rate, as compa with $1.5 billion in second qua

Makes Ductile Iron Castings

YOUNGSTOWN Foundry & Mach Co., Youngstown, is producing du iron castings in sizes up to 12 t for the steel industry under In national Nickel license, reports G. Parker, president. Laboratory t indicate that a blast furnace ladle, just shipped, will not crac warp in service.

ailroads Place Orders

Two carriers buy $21.5 million worth of diesel-electric locomotives. One getting new cars

URCHASE of new rolling stock by ilroads has slowed up but it hasn't en stopped in its tracks.

Pennsylvania Railroad has given ldwin Locomotive Works a $9.5 llion order for 91 diesel-electric lomotive units, Southern Pacific will quire 3100 new freight cars and re 900 box cars a general overuling, and Canadian Pacific Rail-y has ordered 58 diesel-electric lomotives at a cost of $12 million.

Pennsylvania's order includes enty-four 750-hp switchers, forty-e 1000-hp switchers, four 1000-hp ad switching engines, three 2000- switchers, each comprised of two 00-hp units equipped for multiple eration, and sixteen 1500-hp road ight units.

Part of Expansion Program — uthern Pacific's plans are the lat- steps in its program to expand ight-carrying facilities. The new ight cars will consist of 300 steel x cars and 100 drop-end gondola rs. The latter will be 65 feet long accommodate extra long loads. Of 3000 box cars 1000 will be autobile cars, of which half will be ed with the latest type autoload-racks.

A substantial number of the new s, says A. T. Mercier, Southern cific president, may be built in company's own shops, where the rhauling program on the 900 cars l be carried out at an average rate 90 cars a month during 1950.

Since the war Southern Pacific has ered 20,530 freight cars of various es. By the end of this year all ept 1000 of them will have been vered. Delivery of them will be mpleted by the end of next March.

Replacing Steam Locomotives — adian Pacific's order is the largest r placed by a Canadian railway this type of equipment. Monal Locomotive Works, a subsidiary American Locomotive Co., will d 44 of the units and the new nt of General Motors Diesel Ltd. London, Ont., will produce the er 14. The diesels, which will re-e 68 steam locomotives now des-d for service elsewhere on the R system, are to be used in freight vice on the 517-mile Schreiber di-on between Ft. William, Ont., and tier, Ont. CPR is making this vy investment with the expecta- that substantial economies will ult from dieselization.

Montreal Locomotive Works will start making deliveries on this order early in 1950, and GM will turn out its units between July and September, 1950.

Lauds Coal Turbine's Future

The coal-burning gas turbine locomotive is the most serious competitor yet offered to the diesel, says Dr. John Rettaliata, engineering dean at Illinois Institute of Technology, Chicago.

Fuel savings of 50 per cent can be expected from the 4000-hp engine being built by Allis-Chalmers Mfg. Co. and to be tested in about a month, Dr. Rettaliata reported to the Chicage Wholesale Shippers Association. Lubrication costs on the engine, he says, should not exceed one-tenth of those on a comparable diesel, and, he adds, the turbine's purely rotary motion reduces maintenance costs.

The coal-burning gas turbine has been found to be very reliable, many of them having been employed in oil refineries continuously several years without a shutdown, Dr. Rettaliata points out.

Some other attractive features of the new engine: It doesn't require water for operation. And it doesn't smoke.

Machinery Orders to Baldwin

Not only has Baldwin Locomotive Works added a multimillion-dollar order from Pennsylvania Railroad to its books but it has sold a large high-production type bending roll and a plate planer for the new pipe mill Consolidated Western Steel Corp., a United States Steel Corp. subsidiary, will set up at Orange, Tex. (see p. 30).

Baldwin also has received orders for a number of hydraulic presses for manufacture of dry ice and molded plastics, and eight testing machines of various types ranging from 4000 to 400,000 lb capacity.

Bus Demand Takes a Holiday

Bus demand has taken a holiday.

So, ACF-Brill Motors Co., Philadelphia, is operating its bus building facilities at only 15 per cent of capacity, the company having put a large segment of equipment and space on a standby basis and reduced employment rolls.

Indicative of the drop in demand, only 125 busses are on the company's order books, compared with a peak of 2600 in April, 1947. Many municipal and private transportation firms are in dire need of equipment but find financing it an almost insurmountable problem.

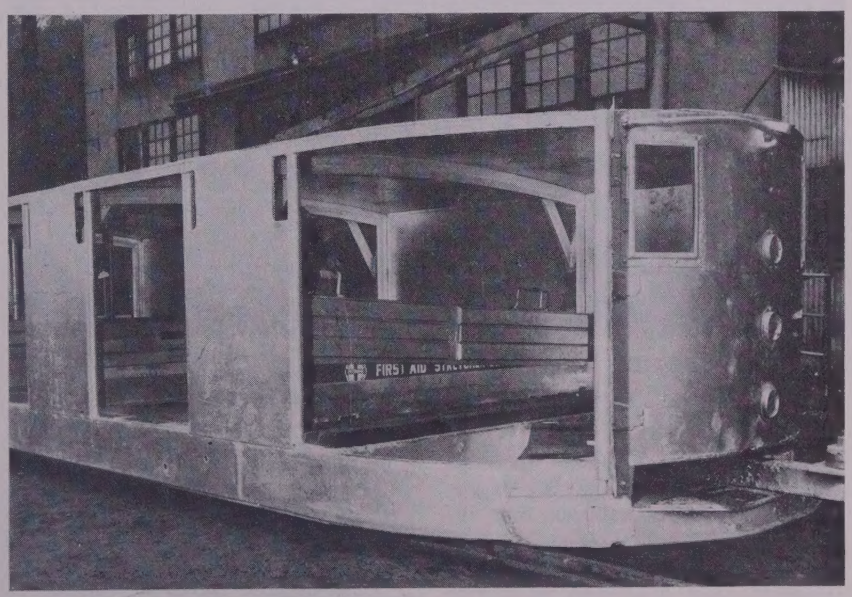
Locomotive Business Good

Installation of 1577 new locomotives by American railroads in the first ten months of 1949 is the greatest in 26 years, says the Association of American Railroads.

Comprising the installations were 1524 diesels and 53 steam locomotives.

On order Nov. 1 were 812 diesels, 17 steam and four electric engines.

The association's report shows 77,618 new freight cars were put into service between January and October and that 17,419 additional cars were on order Nov. 1.



POTENTIAL AMBULANCE: Mantrip cars used for Jones & Laughlin Steel Corp.'s mines in western Pennsylvania are equipped with special first aid outfits. One door of the car is large enough to admit a stretcher. First aid outfit was developed by Mines Safety Appliance Co., Pittsburgh

National Tube Finishing Huge Project

Program started three years ago modernizes and expands Lorain, O., works all the way from equipment to handle incoming raw materials to shipping department

AN EXPANSION and modernizing program so vast it has required three years is nearing completion at National Tube Co.'s works at Lorain, O.

The improvement program reached from one end of the plant to the other—from handling of raw materials to shipment of finished products—and is of key importance in the billion dollar coast-to-coast postwar improvement and development program of United States Steel Corp., of which National Tube is a subsidiary.

New Continuous Mill—Major units in the improvement program at Lorain are the world's first continuous seamless pipe mill, new blooming, bar, and billet mills, an entirely new bessemer steel plant, 177 new by-product coke ovens, and a modern warehouse for pipe storage under roof. It is literally a pipe dream come true.

and sheet mills, and is being employed for the first time at Lorain to turn out long lengths of seamless steel pipe. The new mill is designed to make small size seamless pipe products ranging from 2 to 4.5 in. in diameter. The mill's rated capacity is 18,000 tons of pipe a month.

To Supply Other Plants — Steel rounds for seamless pipe production at Lorain, billets and slabs for the plant's buttweld pipe mills, and additional billets for other plants of U. S. Steel will be produced in the new blooming, bar, and billet mills. This unit includes four major mills —one blooming, one bar, and two continuous billet mills. Twenty-four modern, bottom-fired soaking pits have been installed to reheat for rolling the ingots from the bessemer and open-hearth shops.

The new bessemer steel plant has three active 25-ton converters, and

WORLD'S FIRST CONTINUOUS SEAMLESS PIPE MILL
. . . National Tube Co.'s pipe dream come true

The new steelmaking facilities boost National Tube's rated output at Lorain to about 2,250,000 tons annually.

The continuous mill, developed by National Tube engineers, eliminates several steps in the conventional method of making seamless pipe. The continuous rolling process has long been identified with hot-rolled strip

for spare use a fourth converter. They employ a new deoxidation process developed by National Tube engineers: It makes possible seamless production with bessemer steel.

Concentrates Buttweld Output — Another facet of the program of revamping is the concentration at Lorain of all of National Tube's buttweld pipe production. This led to

installation of new galvanizing cilities for buttweld.

Reaching down into the raw terials end of the works, Natio Tube made major improvements its ore docks on the Black ri where the largest vessels enga in ore shipping on the Great La can be unloaded. Two new Hu ore unloaders have replaced smaller unloaders, and the entire d was rebuilt.

Doubles Coke Production—Coal coke handling facilities have b enlarged and modernized, numer changes have been made in facili for recovery of coal chemicals, a coal and coke laboratory have b provided. Coke production at Lo has been doubled with installa of three new batteries of by-prod coke ovens. Each battery has ovens. Along with four older teries of 52 ovens each, these fa ties can produce 1,650,000 tons coke annually.

Going beyond the productive eq ment of the plant, National T devoted considerable attention and pense to its shipping facilities. built a quarter-mile-long wareh for stocking and shipping of sizes 4 in. and less. Storage capa is 40,000 tons with facilities for h dling several hundred different sta ard pipe items. Assembly line se of the warehouse is designed to sp shipment of customers' orders.

Texas Pipe Mill Site Changed

ACQUISITION of a governm owned building at Orange, Tex., influenced Consolidated Western S Corp. to change its plans and lo its new tube mill at Orange ra than at Houston.

Consolidated Western, U. S. S Corp. subsidiary, offered last to buy the government surplus fa ities located on Consolidated W ern's land at Orange, but the U attorney general ruled that such position would tend to create a uation inconsistent with the antit laws. Consolidated Western withd its offer of purchase and in Oct announced it would locate its pipe mill on property it owns Houston.

Before adjourning this fall, C gress adopted a joint resolution di ting the government's General S vices Administration to consumm on behalf of the government sale of the facilities at Orange Consolidated Western. President T man approved this resolution Oct and the sale followed.

The Orange facilities were a w time shipyard and are adjacent Consolidated Western's existing st tural fabricating plant.

loser Shaves: Both Blade and Electric Razor Sales Soar

Twice as many razor blades will be used this year as in 1939 despite electric shavers

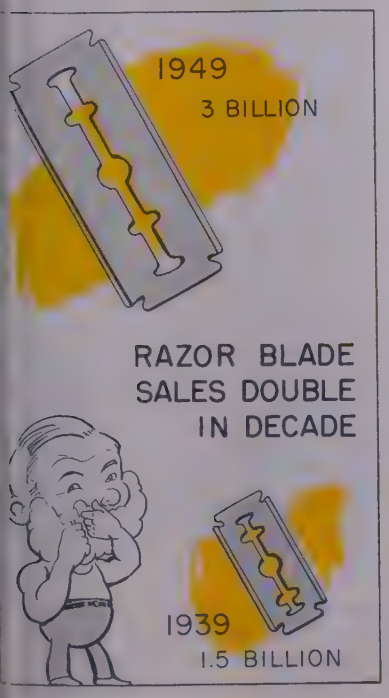
HE FIVE O'CLOCK shadow is dispearing.

Or at least it should be for twice many razor blades are sold today in 1939; this despite the inroads ade by electric shavers. The acmpanying chart shows that 3 bilon blades will probably be sold this ar, compared with 1.5 billion a cade ago. Producers attribute the crease to the larger population, gher incomes which permit men to ave more frequently and the inience of army service when thouands of men had to shave regularly r the first time in their lives.

50 Million Shavers—An estimated million men are using 60 blades a ar. Sales this year are running 10 20 per cent above what they were st year. In 1950 the volume should about 15 per cent above 1949. les this year will probably approxiate $85 million, compared with $45 illion in 1939.

Twenty-four companies contributed the production before the war, t only ten are active now. Among em are Gillette Safety Razor Co., arlin Firearms Co., Pal Blade Co. c., American Safety Razor Corp.

Foreign Sales Poor — American ade makers find themselves bottled on foreign sales because of curncy difficulties. Gillette is probably the best position because it has



MANUFACTURERS of electric shavers generally make all of their parts except the plastic components. Sunbeam's new Shavemaster has a nylon drive shaft connecting the motor with the shaving blade. Being hollow, it can act as a reservoir for lubricant for the two bearings.

eight foreign plants. The United States, Germany and Great Britain were the major exporters before the war. Today Britain is in the lead. Thirty-three British firms export an average of 1,125,000 blades a day.

Production costs this year are slightly higher than last, and 100 per cent higher than in 1939. Research and development work is largely devoted to cost cutting. This year some companies are spending as much as 80 per cent more than in 1948 to develop the specialty machinery needed in manufacturing. Funds allocated for research in the industry now exceed the 1939 appropriations by about 200 per cent.

Razor Steel Sources Shift

A revolutionary shift has quietly occurred in the razor blade industry because in ten years American manufacturers have changed from foreign to domestic steel supplies.

Prior to the war nearly all razor blade steel came from Sweden. Even though Sweden would like to recapture this market, very little is imported from her now because domestic producers can supply all needs, which run to over 8500 tons a year. American razor blade steel prices are competitive with the Swedish and have risen only moderately since the war. This factor has kept razor blade price rises small despite the sharply increased cost of labor.

Until the late 1930s domestic razor steel production was negligible. Razor blade companies made provisions just before the war to assure domestic supplies if the Swedish failed. American steelmen, who hitherto had not bothered with the small-tonnage business, agreed to see what they could do. The result has been that American interests are hanging on to a small but profitable specialty steel market which is growing with the razor blade industry. The steel used is a high carbon alloy made to unusually strict metallurgical specifications from only the best grades of pig iron and scrap.

About 9 million electric shavers are in use. Potential market seen for 25 million

FACE the facts. Electric shavers are here to stay. Some 9 million of them are in use today, compared with an estimated 5 million in 1939.

Manufacturers predict that 25 million men, half of all adult males, will be dry shavers ultimately. Sales now are two to two and a half times what they were in 1939, about on a par with the record 1948 and will probably exceed the 1948 level next year. Sunbeam Corp., Chicago, one of the largest makers, still must allocate its production. Other major manufacturers include Remington Rand Inc., New York, and Schick Inc., Stamford, Conn.

Business Is Seasonal—The industry's business is seasonal; perhaps 70 per cent of the sales volume is concentrated in November and December. A survey of 5000 buyers reveals that 54 per cent were switching from blade shaving and 46 per cent were already using electrics.

The industry has advanced rapidly since the first electric shaver was introduced—by Schick—in 1932. Sunbeam's 1937 model, for example, produced 7 million cutting actions per minute; its next model had 13 million; the 1949 model has 28 million. The increase has come principally through use of a progressively larger head. Sunbeam's 1937 price tag was $15. Prices now are $22-$24.

PUSH-BUTTON PRIVATE TELEGRAPH SYSTEM
. . . U. S. Steel's answer to 12,000 incoming calls

Saves 300 Man-Hours per Day in Message Center

TELEGRAMS between United States Steel Corp. subsidiaries can now be flashed by just the push of a button.

A new telegraph center, the most modern in the world, was completed during the strike at Carnegie-Illinois Steel Corp.'s offices in Chicago. It is getting its first real workout now that mills are again producing steel.

The push-button system, replacing the old cord-and-plug type, is designed for speed and ease in switching the nearly 12,000 incoming messages received each day by the corporation's Chicago station for destination points all over the nation.

Representing a 21,000-mile network leased from Western Union Telegraph Co., the center ranks Chicago as one of the largest telegraph switching centers for U. S. Steel. It was developed by Western Union engineers.

Steel or Hotel Accommodations—Like many other large corporations, U. S. Steel has a private wire telegraph system carrying messages as diversified as an order for hundreds of tons of steel or a request for hotel accommodations. There are ten major switching centers and about 138 stations in 86 towns and cities to provide efficient communication between plants and offices of the corporation's subsidiaries. Any station in the network can transmit telegrams to any other by pushing a button and without any other manual handling of the messages at any point. Each message is typed only once on the typewriter-like keyboard of a teleprinter at the originating point, and flashed to the center. There a clerk, seeing the destination on the tape, touches the proper button. An electric brain connects the message with a circuit to its destination. Operators don't have to continually plug in and out.

Cord-and-plug operators who handled about 235 messages an hour may switch about 400 an hour. They save about 300 man-hours each day.

Big Rural Electric Market

WITH 4,582,016 or 78.2 per cent of the nation's farms receiving central station electric service today, the rural area has become one of the electrical industry's most important markets. So says M. E. Henning, executive vice president and general manager of Penn Electric Switch Co., Goshen, Ind., who spoke before the annual meeting of the National Electrical Manufacturers Association, Nov. 14-18 in Atlantic City, N. J.

44 Per Cent of Population — The market embraces 2590 of the country's 3072 counties and represents 44 per cent of America's population. Farm cash income this year is expected to total about $28 billion. Farm debts and mortgages are at the lowest point in history and savings are at an alltime high.

Recent surveys, Mr. Henning says, indicate that rural customers will buy 3 per cent more electrical appliances than city residents, whereas nonfarm rural residents will 10 per cent more of the same pr ucts than in the case of average families.

Potential business for the electr manufacturing industry in the r market over the next five years be this: $2 billion for electric pliances, $675 million for electr farm production equipment, million for generating equipment, tribution transformers, protective vices and similar apparatus and million for wiring and wiring devi

Machinery for Point 4

Transfer of used Ameri equipment to underdevelop countries proposed

CAN used American mass product machinery be sold or leased to und developed countries under the Po 4 program? Does this proposal s gest a way for metalworking co panies to replace their older equ ment with machinery of latest sign? Would it bolster the dome market for heavy equipment? Wo it enable the metalworking industr to raise their productive level either peace or war?

These are some of the questions ing tossed back and forth amo metalworking executives on the p posal that used machinery be trea like used cars and passed along less affluent neighbors. There is agreement on the answers.

The Proposal — If the Uni States government would o American metalworking compan two simple inducements, a la quantity of older machinery a equipment now in use could be tra ferred to the less developed countr and put to work, says Arthur Ke ing, president of Ekco Products C Chicago, housewares manufacturer

These inducements are special preciation allowances on expor equipment and government guara tees of rental income on leased equ ment.

Mr. Keating believes such st would move large quantities of u machinery to the depressed areas a would help increase American priva investment abroad from last yea $850 million to $2 billion by 1952.

Such shipments abroad, he believ would encourage American compa ies to accelerate their purchases more efficient new equipment a thus bolster the heavy equipment dustries and generally raise the p ductive level of American industry

Want Tomorrow's Tools—Fly the ointment, say machine tool bui ers, is that the foreign countries a mighty pernickety about the kind

chinery they will accept. They 't want yesterday's designs, they nt tomorrow's. And it doesn't tter much if the equipment is ofed for free, at 10 cents on the dolor at other generous concessions. David Ayr, new president of the tional Machine Tool Builders' Assoion and of the Hendey Machine Torrington, Conn., and Tell Bergeneral manager of the NMTBA, nt to this country's experience in ing to sell, lease or give used mahery to foreign countries since the . It didn't succeed under UNRRA. didn't succeed under ECA. They bt that it can be worked under Point 4 program.

bjectives Approved—"Logical, but ossible," is the summation one chine tool man gives the proposal. chinery men generally approve the ectives, but they think it just 't work.

Much of the machinery men's doubt ses from the government's attie in dealing with the beneficiary ntries. Uncle Sam isn't hardled enough. He doesn't follow ough on foreign-aid programs. He sn't back up his nationals investin foreign countries.

ritish Policy Tougher—American chinery builders don't like the way tish and other foreign builders are ading the foreign market. They 't like the thought that they are ing, through the Marshall Plan other foreign aid, for the rehabilion of the machinery industries of British and continental countries, which in turn are becoming serious competitors.

Britain, they say, is doing more for its industry than is the United States —in encouraging sales abroad and offering better depreciation inducements for the replacement of older, more obsolete machinery. In some cases, Britain allows 40 per cent of the cost of new machinery to be depreciated in the first year.

Need Accelerated Depreciation — The United States, says Lloyd D. McDonald, past president of the National Machine Tool Builders Association and vice president of Warner & Swasey Co., Cleveland, in most cases insists on depreciation over at least a 20-year period:

"The facts show in our industry that on the average, owing to our rate of improvement, a machine tool model is rendered obsolete within about seven years after introduction. I doubt whether most companies in doing replacement arithmetic reckon the anticipated profitable life of a new machine at more than ten years.

"As matters stand today, it is impossible for a company to gain out of depreciation allowances the funds sufficient for replacement."

Big Tool Exhibit Planned

British machines, machine tools and scientific instruments will occupy more than 35,000 sq ft of floor space at the Canadian International Trade Fair, May 29 to June 9, 1950. This exhibit will spearhead the British drive for Canadian markets and bears out the warning given to the American Society of Tool Engineers by a leading Canadian industrialist (STEEL, Nov. 7, p. 86).

Some adjustments between established British production methods and Canadian inspection practices have already been made and others will be made, report British industrialists, so that U. K. machines can be integrated into the overall operation of Canadian plants.

October Tool Orders Down

Total new orders and shipments of machine tools in October declined from September's levels; foreign orders advanced fractionally.

The National Machine Tool Builders' Association's indexes for October as compared with September are: Total new orders down to 56.8 from 57.7, shipments down to 62.3 from 67.6 and foreign orders up to 13.8 from 13.7. Because of the decline in shipments the ratio of unfilled orders to shipments rose to 3.8 to 1 in October from 3.7 to 1 in September.

The decline in domestic ordering was largely the result of the steel strike as metalworking firms faced with the prospect of shutdowns were reluctant to buy capital equipment.

Association's indexes are based on average monthly shipments in 1945—1947 equaling 100. Average annual shipments in the base period were $355 million.

Elected by Machine Tool Builders

FREDERICK S. BLACKALL JR.
sident and treasurer, Taft-Peirce Co., Woonsocket, R. I., named second vice president

JEROME A. RATERMAN
President, Monarch Machine Tool Co., Sidney, O., becomes association's treasurer

RICHARD E. LeBLOND
President, R. K. LeBlond Machine Tool Co., Cincinnati, elected first vice president of NMTBA

Windows of Washington

By E. C. KREUTZBERG *Washington Editor,*

Recovery of manganese wasted in steel plant slag would be permitted by process studied by Bureau of Mines. Project is aimed at keeping industry going if manganese is cut off

RESEARCH PROJECT under way in the Bureau of Mines is aimed at keeping the steel industry going if foreign manganese sources are cut off in event of another war.

The project would permit recovery of manganese now wasted in steel plant slag dumps. It is being carried on in co-operation with the steel industry and with financial assistance from the American Iron and Steel Institute. Here's why: Mesabi, nonbessemer iron ore, which will continue to be the backbone of steel production for years to come, has an average manganese content between 0.6 and 0.7 per cent. Right now a large part of this manganese is going into basic open hearth slag, appearing in the form of "runoff," or flush slag containing an average of 10.8 per cent manganese and "final" or tap slag averaging about 6 per cent. It is the flush slag that is involved in the study.

Three Steps—Salvage of manganese from runoff slag would be in three steps:

1. The conversion of flush slag in a blast furnace to high-phosphorus spiegeleisen containing about 30 per cent manganese and 4 per cent phosphorus; 2. "selective oxidation" of the manganese from this molten phospho-spiegel to produce a synthetic ore containing from 55 to 60 per cent manganese low in phosphorus; 3. conversion of this synthetic ore in a second blast furnace to 80 per cent ferromanganese.

"Not Conclusive but Encouraging" —The first and third steps are known to be technically feasible. The second step presents the major problem. Research is being carried out at the Pittsburgh Experiment Station of the Bureau of Mines where experimental equipment is being installed. Preliminary tests already made are described by conservative Bureau spokesmen as "not conclusive, but encouraging."

The runoff slag under investigation is that produced by steel companies using lake ores. The companies represent about 73 million tons of the country's 94,233,460 tons of ingot capacity. At full production, companies using lake ore buy—or make from high grade manganese ore—635,000 tons of 80 per cent ferromanganese. They produce about 4.1 million net tons of flush slag annually, containing 10.8 per cent manganese, or 446,000 tons of manganese. The Bureau of Mines hopes 400,000 tons of manganese—equivalent to 500,000 tons of 80 per cent ferromanganese—can be recovered as standard alloy by the proposed process. This would make companies 79 per cent self-sufficient in manganese if they use lake ore. Instead of buying 635,000 tons of ferro, or producing it from purchased ore, they would have to buy or produce only 135,000 tons.

Success Would Reduce Requirements — Deducting 500,000 tons of ferro reclaimed from runoff slag, from the 820,000 tons required to produce ingots at capacity of 94 million tons, only 320,000 tons of ferro would have to be purchased or produced. Since 1.9 tons of 48 per cent manganese ore now is consumed in production of one ton of 80 per cent ferro, the success of this process would reduce our requirements of manganese ore from 1.6 million to 650,000 net tons annually.

Where would we get this remaining 650,000 tons of ore if a war should cut off foreign sources? The Bureau of Mines is studying how much manganese we have at home and ho can be used. Projects are in prog in the Aroostook, Me., Artillery P Ariz., Batesville, Ark., and B Mont., districts, and in Alabama

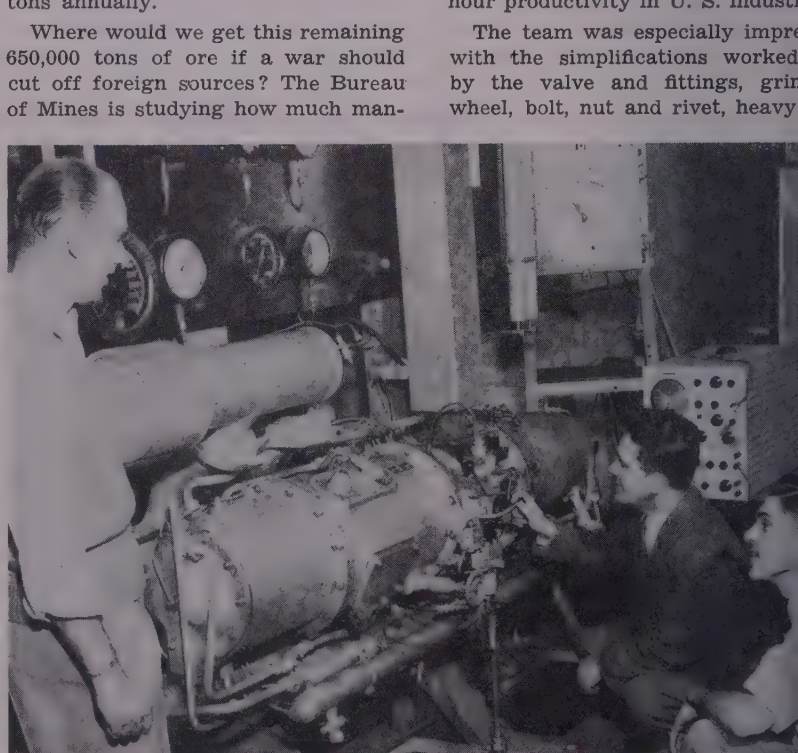
Other possibilities are sched for future study: Ways and mean salvaging manganese from basic hearth tap slag, bessemer vessel der, electric furnace slags, and dust and slag produced by blast naces operating on ferromanga

Pending development of its pro the Bureau of Mines is urging companies to segregate basic o hearth flush slags from other plant wastes for possible future covery of manganese. This pra has already been adopted at t major steel plants, operating 9 the country's 954 open hearths.

British Team Reports Findin

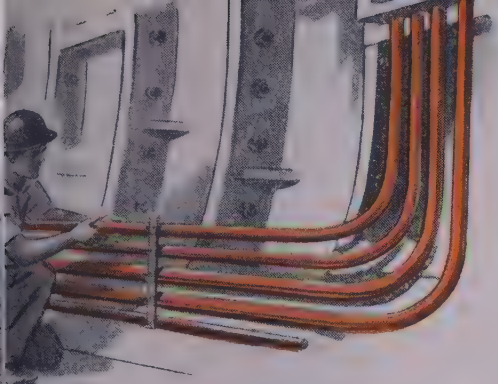
BRITISH TEAM which early summer visited the United State der ECA sponsorship to study t nological "know-how" reports: plification of products to elimi special sizes and styles for w there is little demand has bee important factor in stepping up hour productivity in U. S. industr

The team was especially impre with the simplifications worked by the valve and fittings, grin wheel, bolt, nut and rivet, heavy



"FREE PISTON" DIESEL: The German-developed Junkers diesel may offer neering answers to the problem of developing a turbine engine for automo and trucks. This model at Stanford University's laboratory is an air compre but can be designed as a power gas generator for a turbine. NEA phot

STE



NO PLACE FOR REPLACEMENTS HERE!

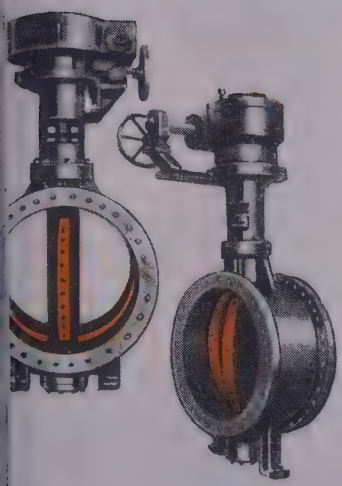
. . so the nation's biggest underwater tunnel uses Everdur† Electrical Conduit to carry traffic light and control cables. New York's Triborough Bridge and Tunnel Authority, builders of the Brooklyn-Battery Tunnel, made selection on the basis of long-time service records on comparable installations.

WELL, WELL, WELL, WELL

That's right, four of 'em. 38" diameter slotted well screens of Everdur, built by the Layne-Northern Company of Mishawaka for Elkhart, Indiana's water supply. Reasons: strength, weldability, machinability, corrosion resistance . . . and nary a trace of rust!

Watching EVERDUR* At Work

†REG. U. S. PAT. O



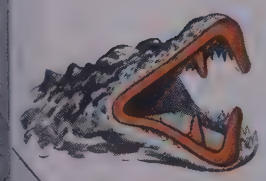
TRAFFIC CONTROLS

Down from the Alvarado Regulating Reservoir rushes the water supply for San Diego at 100-lb. pressure. Many of the vital parts of these mechanical traffic cops are made of Everdur for long operating life. These big butterfly valves, up to 42" I. D., were made by Coldwell-Wilcox Division of Krajewski-Pesant, New York.

HAPPY THOUGHT IN A SQUALL!

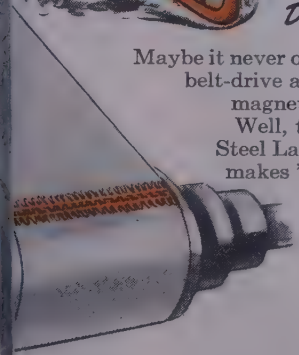
When thunderheads race up and your boat lays over on her beam's end — you pray everything will hang together. That's the time to be thankful for your boat builder's judgment in using strong, tough, non-rust Everdur fastenings

. . . and speaking of seagoing metals, the Design Engineering Company of South Pasadena, California, developed this marine shell block of Everdur. Maximum strength and minimum weight are combined in this one-piece, folded-and-drawn, rivetless block construction. 49190



"DID YOU KNOW" DEPARTMENT

Maybe it never occurred to you that many belt-drive applications require a non-magnetic, spark-resistant lacing. Well, they do. And the Flexible Steel Lacing Company of Chicago makes 'em under the trade name "Alligator." Out of Everdur, of course.



P.S. HOW ABOUT SENDING IN YOUR STORY ON EVERDUR?

WHAT'S YOUR METAL PROBLEM?

Maybe Everdur can help. Our Technical Department is always ready to serve. Just write to The American Brass Company, Waterbury 88, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

Where corrosion resistance counts

ANACONDA

COPPER-SILICON ALLOYS*

chinery and steel industries. It has recommended a simplification campaign for every British industry that lends itself to such an effort.

Two Lending Agencies?

SHOULD the government maintain two business lending institutions instead of the one it does now?

The question is before the Douglas subcommittee on Monetary, Credit and Fiscal Policies, Joint Committee on the Economic Report. The proposal was initiated by Thomas B. McCabe, chairman, Federal Reserve System board of governors. It would empower Federal Reserve banks to make loans, for, say, ten years' maturity, to small business when loans are not available from private sources. Reconstruction Finance Corp. has this power now.

Private banks should be encouraged to take care of financial needs of small business, and in normal times they fulfill this function, says Mr. McCabe. But, the usual sources of short-term credit, he says, may not be adequate in times of financial depression or in such abnormal times as during the defense and war periods. Small business in normal times frequently requires—for purposes of plant modernization and the purchase of machinery and equipment—longer-term funds than private banks are willing to supply through loans. The 12 Federal Reserve banks, says Mr. McCabe, should be authorized to take care of such requirements in the national interest.

He can see no inconsistency in permitting Reserve banks and RFC to operate alongside each other in giving financial assistance to business enterprises. RFC Chairman Haley Hise disagrees. He says flatly, "One source of federal assistance in a particular loan field appears sufficient in the interest of consistent policies and procedure."

Military Procurement Rules

SECTIONS 8, 13 and 14 of the manual on Armed Services Procurement Regulation are approaching the final drafting stages. They should be ready early next year to make the 15-section manual complete.

Section 8, on Termination of Contracts, is about ready for submission to an industry advisory committee for comment and criticism. Section 13, on Property Provided by the Government for Use by Contractors, is in preliminary form and will be submitted to the industry committee after it has been reviewed by the military committee. Section 14, on Inspection and Acceptance, is nearing the final drafting stage.

Principal feature of the new Section 8 is incorporation of restrictions on the discretion of contracting officers and prime contractors. It was added because of bitter criticism by the comptroller general of the manner in which certain contract settlements were handled after World War II. Prime contractors will not be permitted, as in the past, to settle conclusively the claims of subcontractors. Certain administrative safeguards have been inserted to protect the interests of the government in interim financing after termination.

This section provides for a contract clause for termination of contract at the convenience of the government. It spells out a formula whereby compensation is to be largely along the lines of the common law principle of damages. There is an exception: That the right to anticipatory profits —for work not performed—is subject to negotiation. It provides that termination claims must be filed within one year to prevent a repetition of long-drawn out settlement procedure due to dilatory contractors after World War II. It also provides that in cost-type contracts negotiation may be limited to the fixed fee; that contractors who desire to voucher out all their costs after termination rather than negotiate them must give notice within 30 days of the effective date of termination. Provision is made for appeals by contractors to the Armed Services Board of Contract Appeals.

Section 13 states the general policy of the armed services that contracts will be awarded to contractors who have or will furnish the necessary materials and tooling and facilities, and that such property will be furnished to contractors only when "necessary or desirable."

Section 14 at the start will be only a brief statement of general inspection and acceptance policies which can be applied uniformly by the three military departments. It is to be amended at some later date, as a result of a current study, to include more detailed procedures which are necessary on many items of procurement.

Get RFC Loans

LOANS of interest to the metalworking industry by Reconstruction Finance Corp. in September were:

Harvey-Whipple Inc., Springfield, Mass., manufacturer of oil-fired heating units, $500,000, for 4 months, for working capital.

Clyde Porcelain Steel Corp., Cl
O., porcelain jobbing manufactu
$510,000, for 5 years, for purchas
equipment, working capital and
payment.

Columbia Machinery & Engin
ing Corp., Hamilton, O., manufac
er of metalworking, woodwor
and earth-moving equipment, $5
000, for 4 months, for working c
tal.

Trailmobile Co., Cincinnati, m
facturer of truck trailers, bodies
accessories, $10,000,000 (with b
participation), for 5 years, for w
ing capital and debt payment.

Texmass Petroleum Co., Da
Texas, oil and gas production, $
100,000, for 10 years, for work
capital, debt payment, oil prop
purchases.

Argus Inc., Ann Arbor, M
manufacturer of cameras and ph
graphic equipment, $900,000, fo
years, for debt payment.

Michigan Chemical Corp., St. L
Mich., chemical manufacturers,
100,000, for 10 years, for purch
of machinery and equipment, w
ing capital and debt payment.

Aviation Maintenance Corp.,
Nuys, Calif., modification, conver
and overhauling of aircraft, $500,
for 4 years, for working capital.

Ryan Aeronautical Co., San Di
Calif., airplane and parts manu
turer, $1,000,000, for 5 years, for
payment.

Central Iron & Steel Co., Har
burg, Pa., steel plate producer,
650,000, for 5 years, for plant
struction.

Tariff Cuts Contemplated

CONTEMPLATED tariff cuts to
courage imports from Europe will
be made next year without giv
the industries involved an adequ
opportunity to express their view

The State Department's Ta
Agreements Committee is study
the appointment of numerous ind
try advisory committees and c
modity groups and expects to
them into conferences in Washing
in January. Decision to confer w
industry representatives stems fr
the many letters which have b
sent to the department by manuf
turers and business men who fear
effect of lowered tariffs on their
dustries.

The proposed reductions in imp
duties are to be discussed with p
cipal countries at a conference to
held in September, 1950, at a
still to be selected. New recipr
trade agreements are to be neg
ated at that time to become effec
in 1951.

teel Mixes in West Europe's Politics

Intense production race, an obstacle to unity, is shaping up. France worried about Ruhr output gains. Britain defers steel nationalization

EEL is the stumbling block in stern European politics.

haping up is a steel production e that will rival that of the 1920s intensity. It is one of the most icult obstacles in the way of Eur- 's economic unity. These esti- ed figures in net tons for output steel ingots and castings show positions of the contestants.

	1949 Sept.	1949 Oct.	1949 Mo. Av
t Britain ..	1,484,600	1,489,500	1,381,300
ce	719,000	800,000	653,300
ern Germany	836,000	762,800	513,300
ium. xemburg ...	500,000	492,000	578,700

rance and Germany are neck and , a factor causing uneasiness in is and contributing to the French ctance to go along with Britain the United States in granting e freedom to Western Germany. elgium-Luxemburg is slipping in luction and now has reverted to prewar place as the fourth larg- Western European producer. The ix shrinking economy is influenc- political unrest in an area which one of the most stable postwar rnments on the continent.

ationalization Postponed — The ish Labor government has compromised with the Conservative opposition and will postpone steel nationalization until after the next general election, which must be held before next July 1.

German steel shareholders are organizing to forestall any moves by the Bonn government toward nationalization of Ruhr steel. The conservative groups which won a plurality need support of parties favoring mild socialization: Hence, the nationalization tinge in the present government.

German producers are energetic participants in the steel race and are among the loudest protestants against overproduction in Europe. They claim that the French expansion is particularly unjustified (See STEEL, Nov. 21, p. 63).

French Steel Exports Gain

France is retaining only a precarious hold on second place among Western European steel producers, but she has moved into definite control of third place among the world's leading steel exporters.

Latest export figures, for September, show that she has surpassed Great Britain and is behind the U. S. and Belux. French shipments abroad in the month totaled 175,000 tons. This is three times the monthly average for 1943 and 46,000 tons above the 1933 average. Of the September total, 136,000 tons went to foreign countries and the rest to French overseas territories.

Exports may increase even more in the next few months. French prices are competitive with British and Belgian, but are higher than German. The Allies limit Ruhr exports to 900,000 tons yearly.

U. K. Vote To Decide on Steel

The next British general elections may be either on Feb. 23 or Mar. 2; they will decide whether the U. K. industry is to be publicly owned.

In a major compromise with the opposition, Labor agrees not to put the steel nationalization act into operation until autumn of next year—or well after the elections. The Conservatives will void the act if they win. If there is a Labor victory, Prime Minister Atlee says it will be a people's "mandate."

Devaluation proved only a temporary stimulus to Britain's lagging coal export business. Polish and German prices have readjusted to meet the U. K. threat, and now the competitive situation is about the same as last summer—fierce, with German and Polish producers having the edge because of lower costs. British coal men say that a further price reduction today is impossible. The only way is to cut costs by greater productivity. Production now per man-shift is 2520 pounds; hope is that it will be 3360 pounds by 1965.

In 1937, Britain exported 3.7 million net tons of coal a month. Last March it exported 1,140,000 tons.

Ruhr Ownership Issue Rises

The German Shareholders Protective Association has been formed in Dusseldorf and is putting pressure on the Bonn government to abandon even hints of steel nationalization. The group also wants the government to do more to encourage capital investment in the industry. Government and banking representatives are in the U. S. now to drum up funds. Wall Street groups have shown interest, provided guarantees are given that there will be no nationalization.

The fiscal reform earlier and devaluation in September have put the German steel industry on a better financial footing. Stockholders are beginning to take notice again, even though dividend payments have been almost nonexistent since the war.

Prospects for all German metal-

NLESS STEEL SHIPMENT: Last of 24 all-stainless steel railroad cars for the ral Railway of Brazil is lifted aboard the *S. S. Christian Smith* in Philadelphia. ded in the shipment are sleepers, baggage-mail cars, coaches and kitchen-diners. They were made by Budd Co., Philadelphia. NEA photo

working industries except shipbuilding are at least fair. Inability of the three allied high commissioners to agree on allowing German shipyards to build for foreign orders is crippling the industry, says Theodor Schecker, president of the German Shipyards Association. He declares the industry could compete with the British if the Allies permitted it to take jobs. The shipbuilders are just barely keeping their heads above water with repair work.

Belgian Iron Goes to U. S.

The Belgian pig iron industry spurted slightly in October because of orders from American foundries which couldn't get supplies from the strike-bound U. S. furnaces. Luxemburg, Holland and Austria also got some contracts. Even with freight costs, European prices are competitive with American.

New Australian Steel Mill?

H. A. Brassert & Co., New York, is making a survey for a possible steel plant in Western Australia. Iron ore and limestone are available in the state, as is satisfactory metallurgical coke. Previously the limited coke supplies were the drawback, but technological advances have been made in the field since the war.

Australia is still suffering from an acute steel shortage, particularly in wire and structural shapes. Before the war its small domestic production (averaging about 1.9 million tons annually) was supplemented by imports from Britain, France and Japan. Japanese shipments are resuming only now. Domestic production since the war has fallen to 1.3 million tons because of strikes and ore and coal shortages.

Indian Industries To Expand

Tata Locomotive & Engineering Co. Ltd., Jamshedpur, has turned to the Indian government and Imperial Bank of India for a $5.8 million loan to finance its expansion program.

The company hopes to produce 100 locomotives and 100 spare boilers a year. This would make Telco one of India's two major locomotive builders. The other is a government plant in Bengal.

The government of India may also loan $15 million to the Indian Iron & Steel Co. and the Associated Steel Corp. of Bengal to finance expansion of coke and steel production facilities.

Indian Iron & Steel's project calls for construction of ovens to increase output of coke to about 780,000 tons annually. The Bengal project would increase its total steel production from 200,000 to 620,000 tons each year.

$1.5 Billion Lost in Smog

This annual loss estimated by Stanford University experts at air pollution meeting

AMERICA'S annual loss from smog exceeds $1.5 billion. That is the estimate of Stanford University research experts at the National Air Pollution Symposium in Pasadena, Calif.

Scientists and economists who participated in the symposium point out that the cost arises in damage to buildings and plants, equipment and fabrics, excessive laundry and cleaning bills, as well as depreciation of property values in polluted areas.

Cost of $100 Million Yearly—Government and industry expenditures to control smog now total about $100 million annually. Much of this is recovered in valuable materials derived from waste gases: Bromine, chlorine, sulphur dioxide and hydrogen chloride. It is estimated that 80 to 95 per cent of air pollution can be eliminated at reasonable cost.

Not so optimistic about the outlook is G. Edward Pendray, of Pendray & Leibert, New York, who spoke before the Industrial Hygiene Foundation in Pittsburgh. He says industry may now be spending $300 million or more annually to control air and water pollution. Yet the job of bri the nation's air and water to modest standards of purity may billions.

Companies Spend $35 Million says a sampling survey of 50 i trial organizations reveals that 50 alone spent more than $35 m in the last two years to contro and water contamination. The 5 planning additional expenditure at least $32.5 million in the nex years.

Mr. Pendray suggests that bus associations, together with majo dustrial and utility companies, well conduct a national study o problem to develop the outline national program.

Although industrial hygiene perts have made progress in trolling air pollution in factories plant areas, a number of prob must still be solved by research, Frank A. Patty, head of the i trial hygiene department, Ge Motors Research Laboratories.

Mr. Patty outlines some of problems in an article, "Air tamination Standards," for *Stan World.*

In tackling air contamination inside and outside industrial pl hygienists and toxicologists are fronted with:

1. Insufficient data on physiol

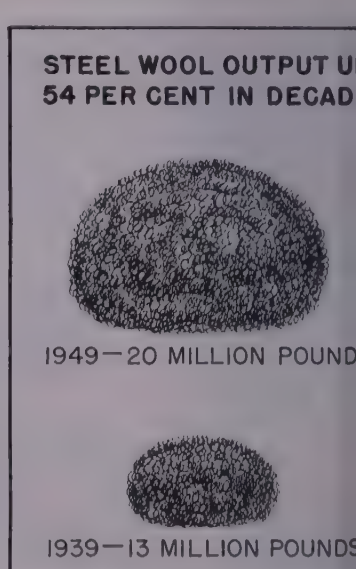
Business Bright for Steel Wool Manufacturers

KITCHEN pans should be brighter and industrial products smoother than a decade ago because the use of steel wool has increased 54 per cent in that time.

The accompanying chart shows that 20 million pounds of steel wool will be used this year for industrial and household consumption, compared with 13 million pounds in 1939. About 70 per cent of this output is for household use and 30 per cent for industrial. The seven companies making steel wool today do an annual volume of about $14 million, compared with a $7 million volume done by the six companies in business a decade ago. Production in 1950 will be 15 per cent more than in 1949.

Major industrial uses for steel wool are in all forms of abrasive work, particularly for products which get painted. New adaptations for steel wool are for filtering purposes.

Production costs are higher in 1949 than in 1948 because the price of wire, the base for steel wool, advanced 20 per cent. Wire quotations have risen 100 per cent since 1939, but



steel wool prices have jumped 50 per cent in the decade. In cu or shaving steel wool from wire, chip or fiber is the finished pro What remains in the machine bec waste material, amounting to a 20 per cent of the steel consumed

effects continued exposure to con-minants has on humans.

2. Lack of standards for permis-le concentrations of air contamin-on—concentrations actually safe humans.

3. Fear that unnecessarily severe d impractical limits will be set for trolling air contaminants.

4. Conflicting viewpoints of experts the subject because much about llution is still unknown.

ate Gets Air Detectives

Pennsylvania has launched an in-sive program to study the prob-n of polluted air.

A special division of the Bureau of lustrial Hygiene, Department of alth, has been established to con-trate on the matter. Principal ans of attack in the campaign will a mobile field laboratory now be- built for the bureau by Mine fety Appliances Co., Pittsburgh. be ready in two months, the lab-atory will be equipped with scien-c instruments and devices to sam-and analyze atmosphere suspect-of containing harmful gases or sts. One instrument in the field boratory will be Mine Safety's elec-static dust and fume sampler.

Air pollution surveys will be made the "air detectives" with the mo-laboratory at the request of in-strialists, civic groups and public icials.

elding Research Heads Named

C. BOARDMAN, research director, cago Bridge & Iron Co., Chicago, s elected chairman of the Welding search Council at its annual meet-in New York. Dr. C. A. Adams, ladelphia, who has been serving chairman of the council since its inning, is named honorary chair-n and Dr. A. B. Kinzel, president, ion Carbide & Carbon Research s Inc., New York, is vice chairman he council.

The Welding Research Council was ated at the request of the Ameri-Welding Society and the Ameri-Institute of Electrical Engineers foster and stimulate co-operative search in the welding field. It also kes readily available in condensed ble form the welding literature of world. W. Spraragen continues serve as director with offices at W. 39th St., New York.

n $1000 Scholarships

N $1000 scholarships in American leges and technical schools will awarded each year to qualified dents interested in engineering and administration in the fabricated structural steel industry.

The first ten scholarships will be given in 1950. They were authorized by the American Institute of Steel Construction when the organization adopted a comprehensive educational program. Scholarships will be awarded on a competitive basis.

Schools where the awards will be made have not yet been selected. Some will be those that offer combined work-and-study courses. Individual structural steel companies will give additional scholarships on the same basis, working through the institute. Several firms already sponsor their own educational plans.

Paul Coddington of Milwaukee, chairman of the institute's educational committee, says support of American education by industry for the protection of free enterprise is a strong motive underlying the institute's plan. A model educational foundation plan is being set up adaptable to any industrial company. Through it a percentage of profit can be set aside to finance educational projects.

Electroplating Wastes Studied

TO EVALUATE known methods of treating plating room wastes and to develop new methods of treatment are the objects of a research project sponsored by the American Electroplaters' Society.

Efficiency of treatment and its cost are being given the greatest consideration in the work carried on by Yale University under direction of Prof. B. F. Dodge. Assisting him are these men from industry: Henry B. Smith of R. Wallace & Sons Mfg. Co., Wallingford, Conn.; M. A. Orr of International Silver Co., Meriden, Conn.; Frank J. Holt of Sodium Products Division of E. I. DuPont de Nemours & Co. Inc., Wilmington, Del.; and Dr. C. F. Gurnham, Hamden, Conn.

Information obtained from the research will enable engineers to design equipment for specific installations and to keep its cost at a minimum. It is conceivable, says the society, that some plating concerns will find it unnecessary to treat all rinse waters but will treat only the wastes resulting from batch dumping of solutions. Cost of equipment would be materially reduced.

Since no satisfactory method was available for accurately determining very small amounts of cyanide in plating room wastes, the development of a method was a must. A procedure has been worked out. It will enable plating plants to determine the degree of toxicity of rinse waters.

CALENDAR OF MEETINGS

Nov. 27-Dec. 2, American Society of Mechanical Engineers: 70th annual meeting, Statler Hotel, New York. Society headquarters are at 29 W. 39th St., New York.

Nov. 28-Dec. 3, 22nd Exposition of Chemical Industries: Grand Central Palace, New York.

Nov. 30-Dec. 2, Society for Experimental Stress Analysis: Annual meeting, Hotel New Yorker, New York. Society postal address is Box 168, Cambridge 39, Mass.

Dec. 1-2, Council of Profit Sharing Industries: Second annual conference, Hotel Roosevelt, New York. Council headquarters are in the First National Tower, Akron.

Dec. 1-2, American Management Association: Conference on corporation finance problems, Waldorf-Astoria Hotel, New York. Association headquarters are at 330 W. 42nd St., New York.

Dec. 2, American Council of Commercial Laboratories: Meeting, Hotel Statler, Washington. Council headquarters are at 318 Evans Bldg., Washington.

Dec. 6, Material Handling Institute: Annual meeting, Hotel Commodore, New York. Institute headquarters are in the Clark Bldg., Pittsburgh.

Dec. 7-9, National Association of Manufacturers: Congress of American industry, Waldorf-Astoria Hotel, New York. Association headquarters are at 14 W. 49th St., New York.

Dec. 8-10, American Institute of Mining & Metallurgical Engineers: Seventh annual conference of Electric Furnace Steel Committee. Institute headquarters are at 29 W. 39th St., New York.

Dec. 9, Malleable Founders' Society: Western sectional meeting, Drake Hotel, Chicago. Society headquarters are at 1800 Union Commerce Bldg., Cleveland.

Dec. 12-15, National Warm Air Heating & Air Conditioning Association: Meeting, Hotel Cleveland, Cleveland. Association headquarters are in the Society for Savings Bldg., Cleveland.

Dec. 21-22, National Electrical Manufacturers Association: Fourth annual national farm electrification conference, Stevens Hotel, Chicago. Association headquarters are at 155 E. 44th St., New York.

Dec. 26-31, American Association for the Advancement of Science: Meeting, New York. Association headquarters are at 1515 Massachusetts Ave., Washington.

Jan. 10-11, American Home Laundry Manufacturers' Association: Fourth national home laundry conference, in Chicago.

Jan. 10-12, Conference on Industrial and Safety Problems of Nuclear Technology: Sponsored by New York University and Atomic Energy Commission, at New York University, Washington Sq., New York.

Jan. 10-12, Society of the Plastics Industry: Reinforced plastics division meeting and fifth annual technical session, Hotel Cleveland, Cleveland. Society headquarters are at 295 Madison Ave., New York.

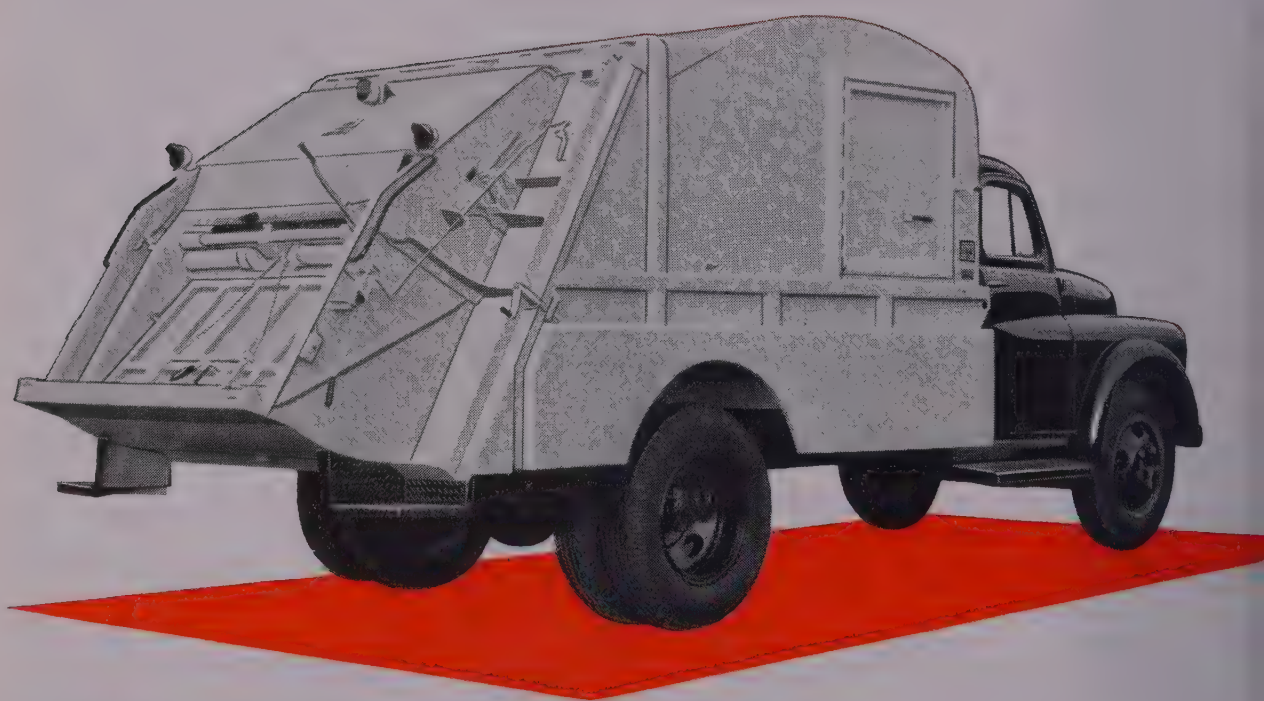
Jan. 16-19, Plant Maintenance Show: Sponsored by American Society of Mechanical Engineers and Society for the Advancement of Management, at the Public Auditorium, Cleveland. Mechanical Engineers' headquarters are at 29 W. 39th St., New York.

Jan. 18-20, American Society of Civil Engineers: Annual meeting, Hotel Commodore, New York. Society headquarters are at 33 W. 39th St., New York.

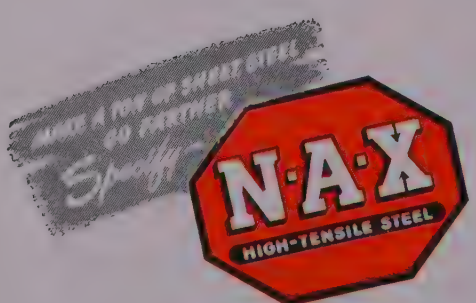
Jan. 22-24, Institute of Scrap Iron & Steel Inc.: Annual convention, Hotel Statler, Washington. Institute headquarters are in the Dupont Circle Bldg., Washington.

Jan. 30-Feb. 1, American Material Handling Society, Chicago Chapter: Midwest material handling conference, in conjunction with Illinois Institute of Technology, in Chicago.

another use for N-A-X HIGH-TENSILE STEEL



The modern Gar Wood Load & Packer for garbage and rubbish.



The high corrosion-resistance and durability of N-A-X HIGH-TENSILE makes it ideal for use in garbage disposal trucks and similar applications. Another reason why industry is rapidly changing to N-A-X HIGH-TENSILE.

GREAT LAKES STEEL
Corporation
N-A-X Alloy Division • Detroit 18, Michigan
UNIT OF NATIONAL STEEL CORPORATION

A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Hudson invades lower-price field with 6-cylinder Pacemaker model, still larger and heavier than Big Three cars . . . Pontiac, Mercury take wraps off 1950 series. Changes are minor

DETROIT

'NVASION of a lower-priced field" d the "completion of a task engi- ers set for themselves four years o" is how Hudson describes intro- ction of a new Pacemaker 6-cy- der model, carrying list prices from 675 for a three-passenger coupe to 795 for a four-door sedan, averag- g approximately $250 under the esent six in the Super series.

While wheelbase is 5 inches shorter d overall length pulled in by 6 ches, there has been no sacrifice in e generous 64-inch seat widths, low nter of gravity, "step down" prin- ple of body construction or the 60- ch overall height pioneered by the mpany with its 1949 models. Shorter heelbase (119 inches) and length 01½ inches) have permitted a eight reduction of about 200 pounds.

Better Forward View—One impor- nt feature is a much-improved view rward, as a result of a shorter hood d moving the passenger compart- ent ahead slightly. This has put little squeeze on the engine com- rtment, although it still accom- odates a 112-horsepower six with 2 cubic inch displacement without o much crowding. Bore is 3 9/16 ches, stroke 3⅞ inches, compression tio 6.7 to 1, or 7.2 to 1 with a high- mpression aluminum head. The en- ne is said to be completely new, t a modified version of the present e offered in Super and Commodore ries. Performance and economy e aided through use of a dual jet, ple range, downdraft carburetor d a thermostatically controlled rburetor heater which utilizes ex- ust gases to heat fuel passing rough the intake manifold.

Semiautomatic Transmission — modification of Hudson's semiauto- atic Drivemaster transmission is of- red under the name Supermatic ive. It is a two-range unit, which n be shifted over to conventional ive by manipulating a dash button, d in high range provides what is scribed as a high cruising over- ive gear, not a conventional over- ive as has been optional in the e past.

Body styles are in both two-door d four-door types, either stream- lined or notched-back, which may be specified in any of 12 solid colors and four two-tone combinations. An interesting new treatment on inside door trim is a gray and spruce blue colored vinyl plastic called Durafab, said to possess excellent resistance to scuffing, cracking, splitting or peeling, as well as being easily cleaned with a damp cloth.

A. E. Barit, president and general manager of Hudson, says:

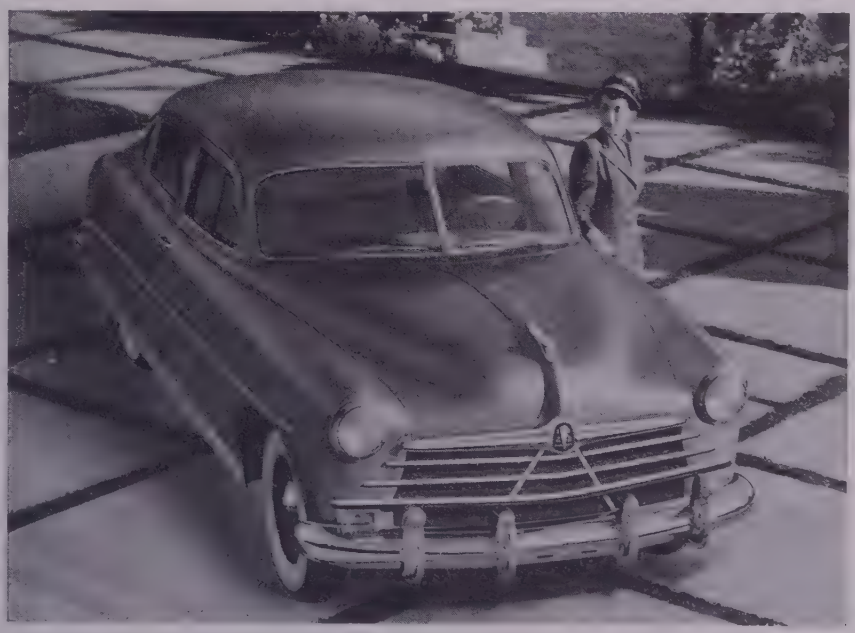
"Hudson would not invade a lower-price field with a pop gun. Here is a block buster—an exciting new automobile no one else in the industry is prepared to build today."

New Pontiac Models Shown

WRAPS were taken off the 1950 Pontiac officially last Friday, after production ground to a halt the day before Thanksgiving. Twenty-eight improvements are listed, although most of them will defy immediate detection. The 8-cylinder engine has ⅛-inch larger bores to increase displacement from 249 to 268 cubic inches and raise horsepower from 104 to 108. Crankshaft rear bearing is slightly larger in diameter and a positive rear bearing oil seal has been added. Increased engine power has dictated a boost in clutch diameter from 9½ to 10 inches on models carrying Synchro-Mesh transmission. Service mechanics are expected to welcome the addition of a tappet access door on the inside of the right front fender. When the door is removed, along with the right front wheels, the engine tappets come into full view for ready adjustment. Rear spring bushings are now of rubber in the interests of reducing shackle pin rattle, road rumble and power transmission noises.

Body Rigidity Improved — Body rigidity has been improved by changing the roof rail from channel to box-type steel section. Door locks have been made more freeze-proof and, as a final touch, the wheel jack and tools are held firmly in rear compartments with the aid of a couple of small coil springs.

Pontiac expects to throw major sales emphasis next year on its two-door 6-cylinder model, the lowest-priced of the line. Utility as a business coupe combined with pleasure car will be stressed. Plant capacity for building 500,000 cars annually stacks up against a production record of probably 330,000 in the current calendar year, so there is still plenty of room to handle more orders if they are forthcoming. Prices on



HUDSON PACEMAKER INVADES LOWER-PRICE FIELD
. . . not a pop gun but a block buster

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new models are unchanged except for a $250 reduction on the all-steel station wagon.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,966
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	604,351	489,736
August	678,092	478,186
September	657,078	437,181
October	605,000*	516,814
November	.....	495,488
December	.....	514,337
12 mos.	.....	5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
Nov. 5	116,699	118,229
Nov. 12	114,856	116,029
Nov. 19	115,683	120,718
Nov. 26	75,000	89,482

Estimates by Ward's Automotive Reports

1950 Mercury Introduced

THE 1950 Mercury rounds out the list of newcomers in the passenger car field for the past week. In most respects it echoes the improvements made in the Ford line and described here in some detail a week ago. Body styling is basically the same as in 1949, except for decorative touches like nameplates, handles and instrument panel treatment. Upholstery details have been "customized" and a flock of new body colors will be available.

More Automatic Transmissions

THE industry expects a good deal of jockeying next year in the passenger car field over the subject of automatic transmissions, what with Chevrolet and Ford both scheduled to have units available for around $150, Nash and Lincoln continuing to feature Hydra-Matic drive, Studebaker shortly to offer a torque-converter design, Packard extending its Ultramatic to less-expensive models, and Chrysler possibly coming up with something new in this line for Plymouth.

Prices May Drop—With long experience in building Hydra-Matic transmissions for Oldsmobile, Cadillac and Pontiac, and now for Nash and Lincoln, General Motors is expected to move in the direction of lowering the cost of the device. Over a million Hydra-Matics have been produced and it is an old automotive axiom that as production goes up, costs go down. So it will not be surprising to see some shading of the extra charge assessed by Olds and Cadillac for automatic transmissions, Pontiac already having trimmed the charge by $25 to $158.50.

This will not mean, however, any reduction for units supplied Nash and Lincoln, since contracts for the transmission were negotiated at firm prices with these manufacturers and if GM chooses to cut the fee for members of its own family, the result is just that much competitive advantage over outside buyers. Ultimately it could mean Nash and Lincoln will switch to another design, if they can locate one with the desired price and performance characteristics.

Ford Revises Pension Plan

REVISION of Ford Motor Co.'s pension plan for salaried employees has brought it into line with the system going into operation for hourly-rated labor. The basic plan will be non-contributory and applicable to all salaried employees regardless of age and without any waiting period. In addition, each employee receiving a base salary above a stated amount—tentatively $3600 a year—will be entitled, but not required, to participate in a supplementary program for the purchase of additional pension benefits, to be paid for jointly by company and employee. Basic plan provides benefit of $100 a month, including primary federal Social Security, all employees retiring after 30 ye of service at age 65.

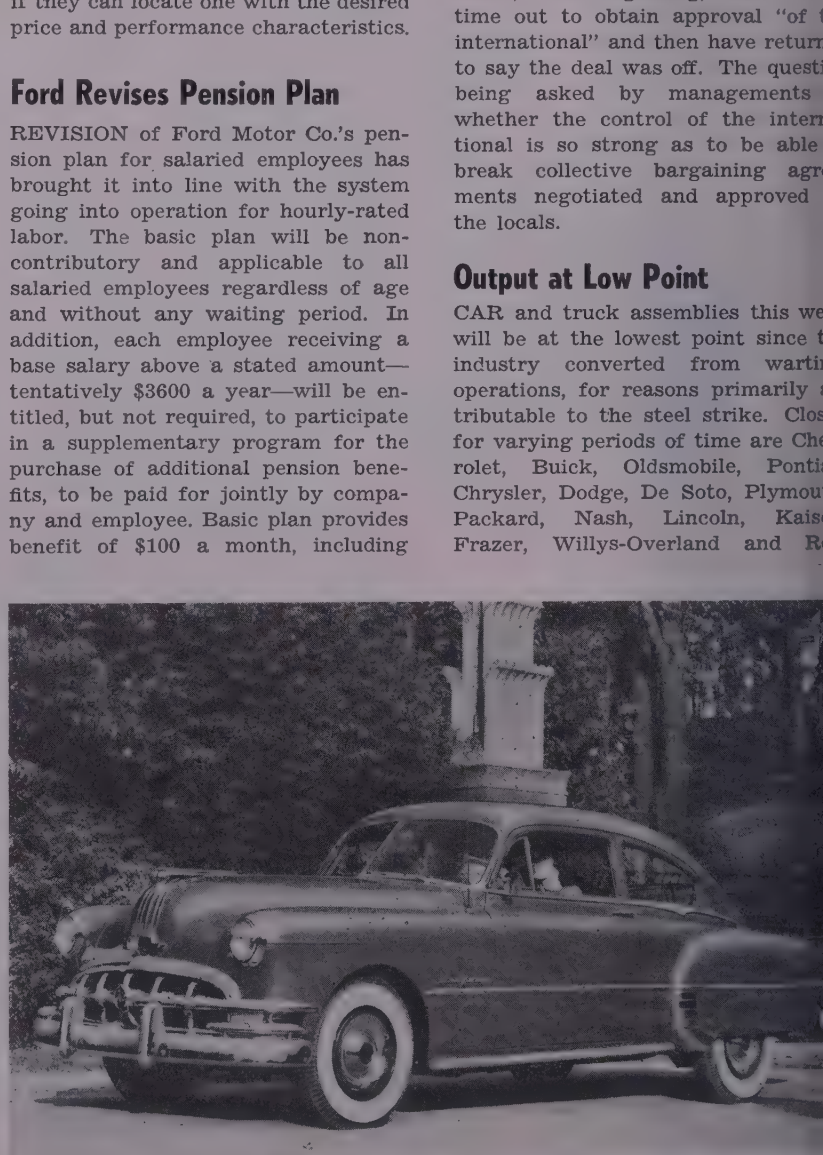
The supplementary program v provide benefits related to the cove portion of the base salary and ye of service. Employees will not able to subscribe to it until they ha completed two years of service, b at that time some credit will be giv for past service. Revisions in t pension system will become effect Mar. 1, 1950.

Local Settlements Denounced

FROM the parts industry it is ported that a few companies ha reached agreements with their uni locals for new contracts, the ter including wage adjustments, improv insurance plans and a moratorium pension demands for five years. T locals, after agreeing, have tak time out to obtain approval "of t international" and then have return to say the deal was off. The questi being asked by managements whether the control of the inter tional is so strong as to be able break collective bargaining agr ments negotiated and approved the locals.

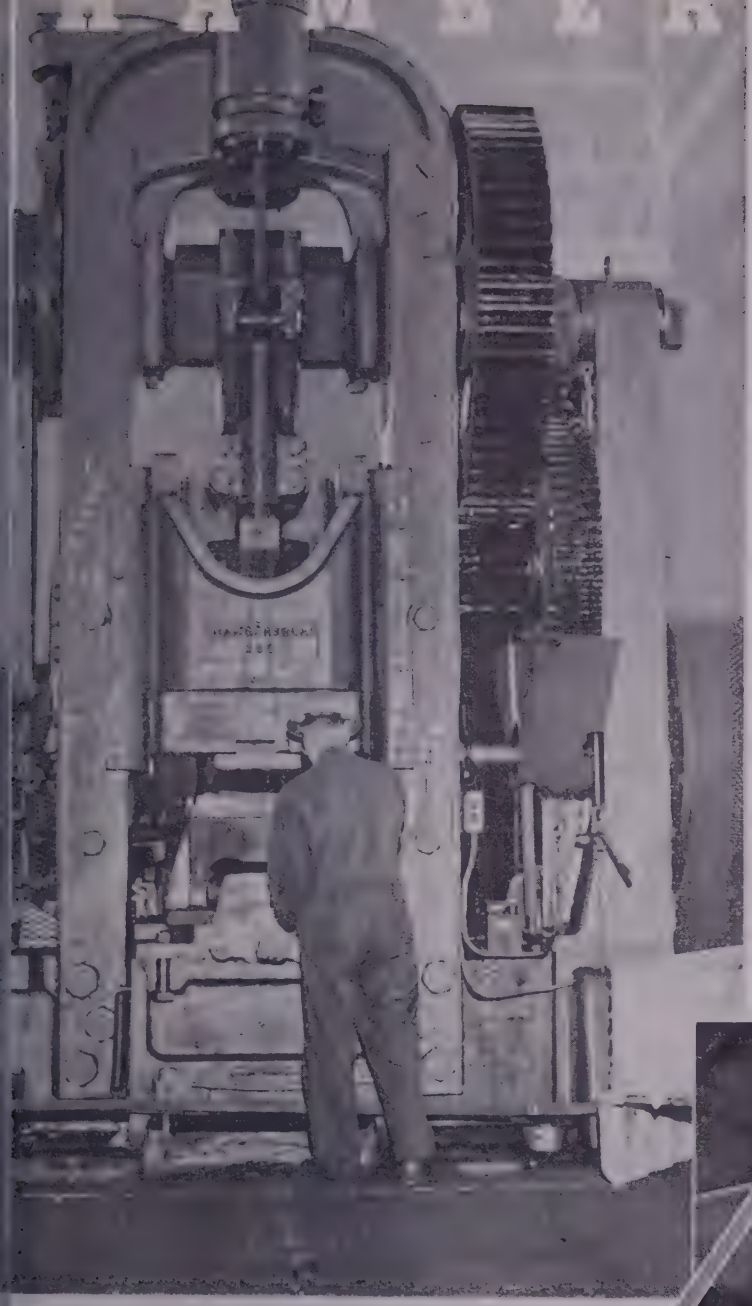
Output at Low Point

CAR and truck assemblies this we will be at the lowest point since t industry converted from warti operations, for reasons primarily a tributable to the steel strike. Clos for varying periods of time are Che rolet, Buick, Oldsmobile, Ponti Chrysler, Dodge, De Soto, Plymou Packard, Nash, Lincoln, Kais Frazer, Willys-Overland and R



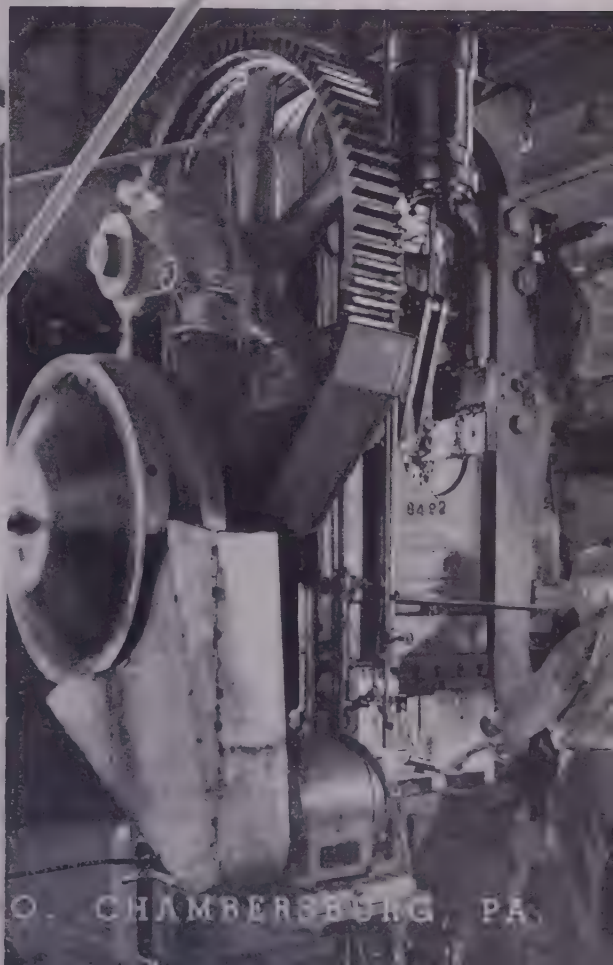
1950 PONTIAC WITH HYDRA-MATIC OR SYNCHRO-MESH TRANSMISSION

. . . emphasis next year on two doors and six cylinders



SBURG

Here is something to consider when in the market for a trimming press:



E CHAMBERSBURG

EL SIDE TRIMMING

ESS IS PRACTI-

LLY UNBREAKABLE!

HAMBERSBURG ENGINEERING CO. CHAMBERSBURG, PA.

Two Bids Submitted

By American Steel & Tube Corp. to GSA for government-owned steel castings plant

AMERICAN Steel & Tube Corp., Cleveland, O., submitted two bids—the only ones—to General Services Administration for a government-owned steel castings plant at Scullin Steel Co., St. Louis, Mo.

One bid was $1.8 million in cash; the other $2,205,000, 15 per cent of which was to be paid down if the bid was accepted. They will be studied by the War Assets liquidator who is to make recommendations to Jess Larson, agency chief.

American Steel & Tube is a Delaware corporation formed in February of this year with a capitalization of over $1 million. It will manufacture seamless oil well casing, upset tubing and submerged weld expanded linepipe. The company will do its own coupling and threading.

Mark H. Gathmann, president, told STEEL that the company plans to employ from 1000 to 1200 persons. Its annual capacity will be about 150,000 tons of oil well casing and from 150,000 to 200,000 tons of linepipe.

Granite City To Use Oxygen

OXYGEN generators made by Air Products Inc., Emmaus, Pa., will be used to extract the element from the air in Granite City Steel Co.'s operations at Granite City, Ill.

N. P. Veeder, vice president in charge of operations of Granite City, says the generators are the most modern and economical means of supplying the mill's oxygen requirements. He says his company is working on a process which will use the generators' by-product, nitrogen, in certain steelmaking operations.

Miehle Buys Star Electric

MIEHLE Printing Press & Mfg. Co., Chicago, bought all capital stock of Star Electric Motor Co., Bloomfield, N. J.

J. E. Eddy, president of Miehle, says no changes in personnel or policies of Star are contemplated. The present officers of Star will manage Kimble Electric Division of Miehle at Burlington, Iowa. The arrangement will permit Star and Kimble to offer the trade a line of electric motors ranging in size from ½ to 600 hp.

Miehle was established 60 years ago. It has had an interest in Kimble for over 20 years because of the importance of electrical applications in the graphic arts. Star, founded in 1910, has long been an independent motor manufacturer. It features in its line a variety of brake, gear, marine, standard and special motors.

Chemical Corp. Opens New Lab

NEW LABORATORY, complete with modern equipment for research and testing in the metal finishing field, was added by Chemical Corp., Springfield, Mass.

The company manufactures Luster-on Zinc Bright Dip and several other metal finishing specialty products. It distributes a line of platers' equipment and supplies, including Pennsalt cleaners, in New England.

New Outlet for Hyster

HYSTER Co., Portland, Oreg., will formally open its new industrial truck retail sales and service building in San Francisco at the end of this week.

The 10,000-sq ft store is located on a four-lane arterial highway. Complete service for all makes of industrial trucks is provided in the 7200-sq ft maintenance shop, says Ray Ronald, western division sales manager.

On display for visitors will be seven different models of industrial trucks and a number of special-purpose attachments. R. L. Golden is manager. His 18-person staff will handle sales and service in 43 counties of northern California and western Nevada counties.

Safety Awards for Revere

TWO Revere Copper & Brass plants with records of no accid for the past year got first p awards from the National Sa Council.

The Chicago Mfg. Division and Baltimore (Canton, O., plant) l sion made the remarkable safety formances. The average frequ rate of accidents reported by pl in the 1948-49 Metals Section test sponsored by the council 10.22.

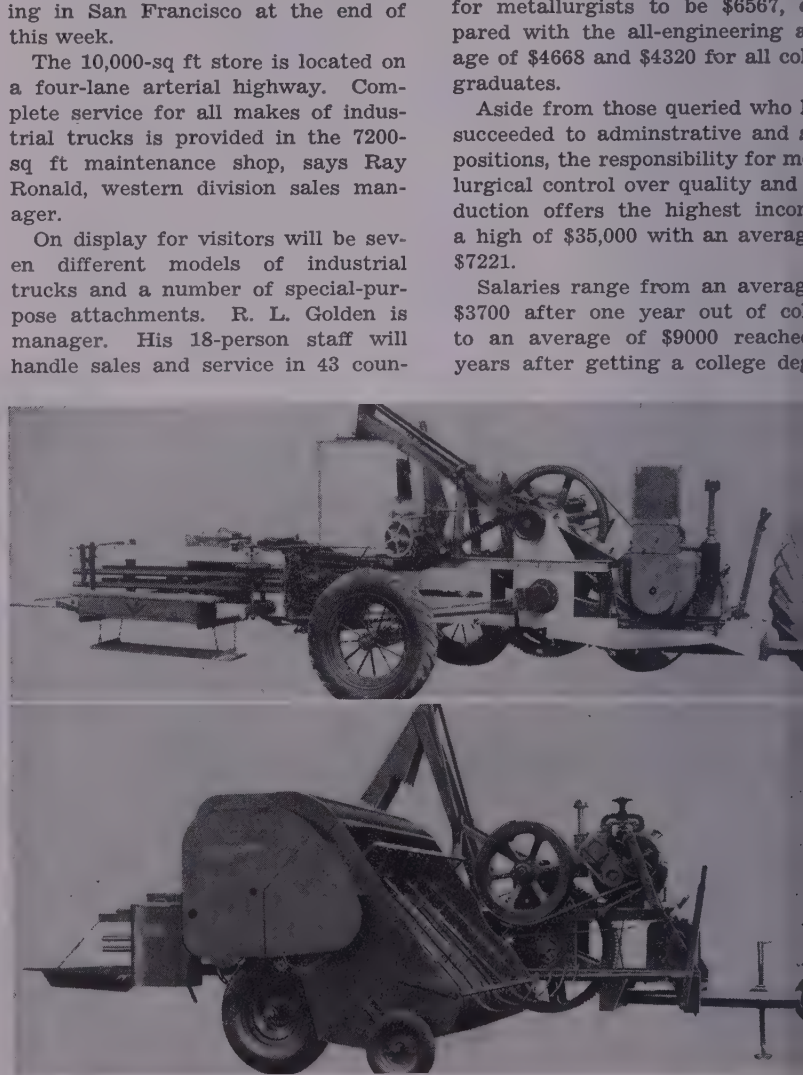
Metallurgists Get Top Pay

METALLURGISTS get the hig pay in the engineering professio

A survey by the American So for Metals shows the average inc for metallurgists to be $6567, pared with the all-engineering a age of $4668 and $4320 for all co graduates.

Aside from those queried who succeeded to adminstrative and positions, the responsibility for m lurgical control over quality and duction offers the highest incor a high of $35,000 with an averag $7221.

Salaries range from an averag $3700 after one year out of co to an average of $9000 reache years after getting a college de



MECHANIZED HAYMAKING: A decade of farm engineering is shown here. view shows one of the first automatic pickup balers brought out by New Hol Machine Co., New Holland, Pa., subsidiary of Sperry Corp., in 1940. The model, below, has 20 per cent fewer parts, a simplified design and is e for the farmer to operate and maintain. NEA photo

RIEFS...

rner & Swasey Co., Cleveland—ret lathes, single and multiple ndle automatics, tapping and eading machines—appointed Hal-e Machinery Co. to serve W & S stomers in Oregon. Hallidie already resents the company in Washing-. Harron, Rickard & McCone Co., n Francisco, was appointed to rep-ent W & S under supervision of newly enlarged factory branch in s Angeles.

—o—

thern States Iron Roofing Co., vannah, Ga., was appointed dis-utor for Reynolds "Lifetime" alu-num mill products and architec-al shapes. Southern States will ck sheet, plate, rod, wire, bar and pes in a wide range of sizes, knesses, alloys and tempers. Sales a of the new distributor includes 13 southeastern states blanketed ribution-wise by 14 branch ware-ses.

—o—

onial Broach Co., Detroit—broach-broaching machines, hydraulic sses and other equipment—ap-nted F. H. Harris Co., Worcester, ss., New England sales and service esentative.

—o—

eral Controls, Glendale, Calif. — matic, pressure, temperature, level flow controls—opened new fac-branch office facilities in Minne-lis, Buffalo and Baltimore. Branch nagers in the newly opened offices R. Roger Rosell Jr., Paul A. ngren and Fred H. Angier, re-tively.

—o—

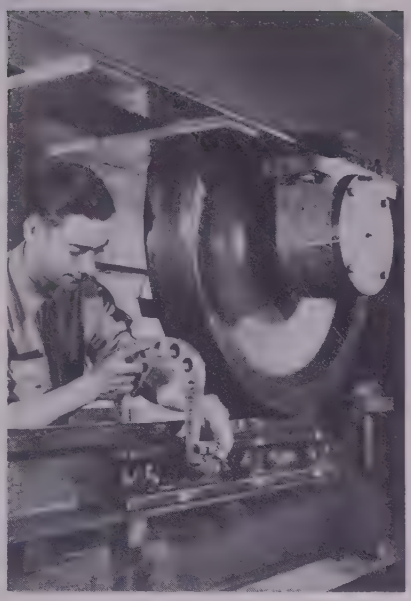
lmar Co. began business as a cus-steel fabrication firm in Berk-, Calif. It will serve the Coast ward to Colorado. K. S. Keese, etary-treasurer of San Jose Pipe Tank Co., is manager of the new pany.

—o—

ania Electric Products Co. Inc., York — photographic, lighting, and electronic equipment—plans stablish a warehouse and assem-plant for its products in the San ncisco area. The company also erect a similar plant at Vernon, burb of Los Angeles.

—o—

nges in titles of **Henry J. Kaiser** rprises continue. Permanente uls Corp. is now Kaiser Aluminum hemical Corp. The sales subsid-Permanente Products Co., is er Aluminum & Sales Inc. Mr. er says aluminum orders for de-y in November were at a record g. Shipments this month will be



TWELVE YEARS IN TWO MONTHS: Prof. R. S. Jensen of the University of Illinois tests rail joint bars in a machine that telescopes 12 years of wear into two months. Redesigned bars have considerably longer life than older models. Since bars cost $5 a pair and there are 273 joints to each railroad mile, the new bars save railroads a lot of money. NEA photo

the largest in the company's history.

—o—

Kaiser Industries Inc. through its Kaiser Gypsum Division acquired Standard Gypsum Co., Long Beach, Calif., and another gypsum plant at Redwood City, Calif.

—o—

Port Weller Drydock Co. will construct a 654-ft freighter, largest Canadian ship to ply the Great Lakes. Colonial Steamships Ltd. signed a contract for the 13,000-ton bulk carrier which will be built at Port Weller, Ont.

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Industrial Oil Division of Swift & Co. will move its administrative offices from Chicago to Hammond, Ind. The move will be completed by yearend.

—o—

Alabama Pipe Co.'s new plant for manufacture of centrifugally cast iron water pipe was completed at Anniston, Ala., by Rust Furnace Co., Pittsburgh, the designer-constructor. The furnace, a continuous conveyor type, has a capacity of 100 tons of pipe in eight hours.

—o—

Pennsylvania Transformer Co. paid War Assets of the General Services Administration about $1 million for the wartime aluminum plant in Canonsburg, Pa. Pennsylvania Transformer, erstwhile Pittsburgh concern, occupies part of the plant. Departments of Continental Can Co., National Metal Products Co., Radio Corp. of America, National Can Co. and L. H. Smith Hardware Co. occupy other parts of the plant under a subleasing arrangement with the transformer company.

—o—

Whiton Machine Co., New London, Conn., appointed Anderson & White Supply Co., Chicago, Ill., as its agent to handle sale of lathe chucks and centering machines. Standard Equipment & Supply Co., Hammond, Ind., is a new Whiton representative for the sale of lathe chucks.

—o—

Allied Foundry Co. Inc., Jersey City, N. J., was organized to operate the former plant of American Foundry & Castings Co. in production of soil pipe. The company expects to get underway in February with a daily production of 45 tons and work up to 70 tons.

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Clyde Porcelain Steel Co., Clyde, O., was granted a $500,000 loan by Reconstruction Finance Corp. The loan assures the company of working capital; it will make it possible to install modern machinery.

—o—

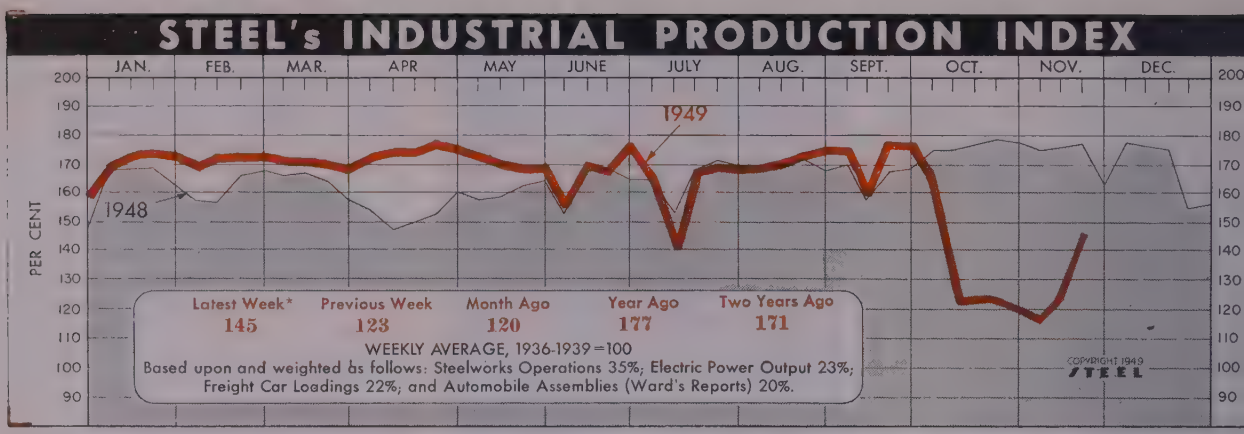
Weirton Steel Co.'s Julius H. Strassburger, manager of the service and maintenance department, and William F. McGarrity, assistant to the manager of Weirton's Steel Works, left for Europe. They will study the use of oxygen in steelmaking and other phases of European steel practice. Because of the low grade of European coal and ore, the use of oxygen in steelmaking has been highly developed there.

—o—

Arthur Colton Co., Detroit—pharmaceutical and packaging machinery—appointed Miller Sales Co., Cincinnati, representative in Chicago and surrounding territory. Miller continues to represent Colton in Cincinnati and a large area in the Midwest.

—o—

Process Industries Engineers Inc., Pittsburgh—specialist in design, application, contracting, servicing and sale of complete equipment for processing industries—appointed W. A Coyle western New York district manager. Companies represented through the western New York office are: Patterson-Kelley Co., International Engineering Inc., Warren Steam Pump Co., Hetherington & Berner Inc., B. H. Hubbert & Son Inc., Gruendler Crusher & Pulverizer Co., Tri-Clover Machine Co., Waukesha Foundry & Machine Co., and Rietz Mfg. Co.


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
PER CENT
1949
1948
Latest Week* 145
Previous Week 123
Month Ago 120
Year Ago 177
Two Years Ago 171
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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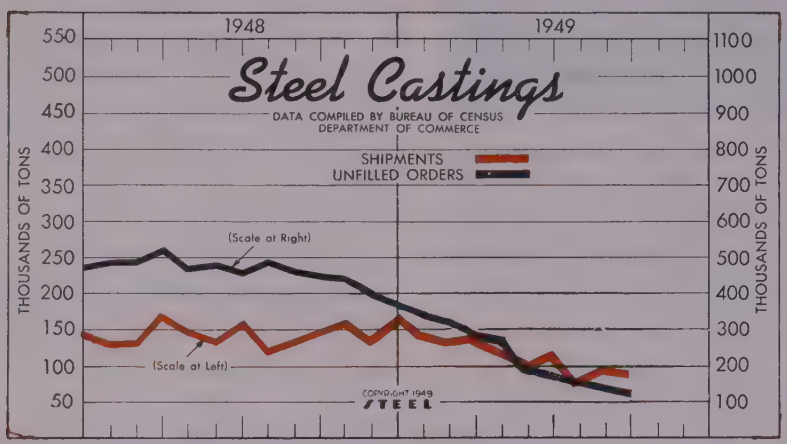
*Week ended Nov. 19 (preliminary).

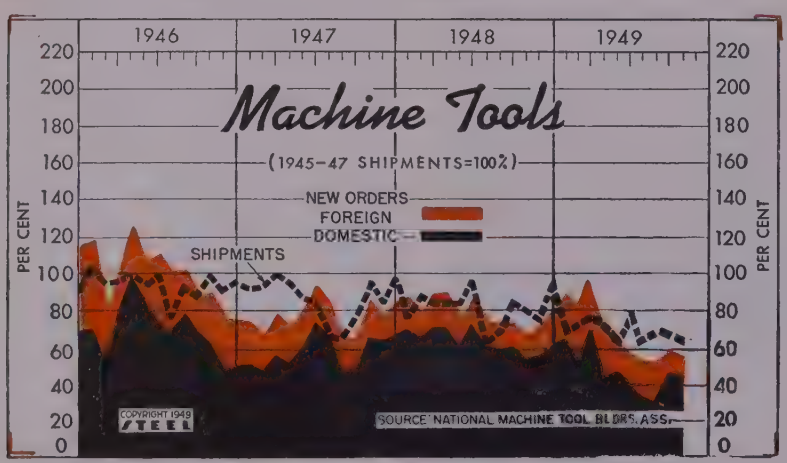


Steel Castings

(Net tons in thousands)

	Shipments			Unfilled Orders*		
	1949	1948	1947	1949	1948	1947
Jan.	140.6	141.1	139.0	338.9	491.7	365.5
Feb.	135.0	142.4	125.6	320.2	497.1	421.4
Mar.	138.9	162.9	134.9	284.8	508.8	434.9
Apr.	120.0	150.3	144.2	250.5	472.4	427.6
May	106.2	143.3	140.9	191.5	482.5	443.2
June	116.1	152.9	139.0	173.2	470.0	445.5
July	78.7	120.4	117.0	155.5	497.4	473.9
Aug.	90.0	140.2	120.4	143.6	472.5	478.6
Sept.	86.5	149.2	137.4	127.7	448.0	526.2
Oct.	....	153.0	148.4	....	424.5	497.3
Nov.	....	146.8	130.1	....	395.0	493.3
Dec.	....	157.4	148.1	....	354.5	489.4

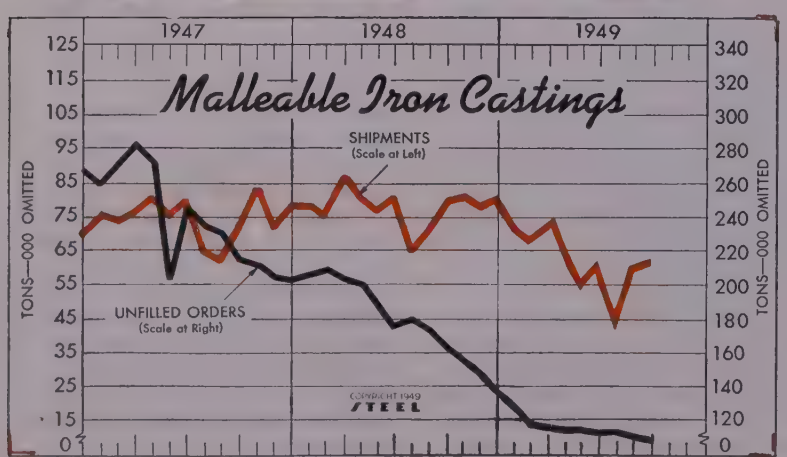
*Castings for sale.



Machine Tool Indexes

(1945-1947 Shipments = 100)

	Orders				Shipments	
	Total		Domestic			
	1949	1948	1949	1948	1949	1948
Jan.	87.0	83.1	65.1	69.1	68.8	75.3
Feb.	80.9	77.3	54.4	64.6	70.3	87.1
Mar.	93.5	86.3	71.2	70.2	75.8	83.6
Apr.	70.1	86.3	47.0	72.2	74.7	82.0
May	63.7	73.5	47.9	62.1	72.8	82.6
June	53.6	83.4	38.0	71.5	79.0	94.4
July	48.0	74.0	34.0	61.1	60.7	62.4
Aug.	51.5	73.7	32.7	60.9	67.3	69.8
Sept.	57.7	73.1	44.0	61.5	67.6	84.7
Oct.	56.8	67.4	43.0	53.4	62.3	80.4
Nov.	...	72.2	...	54.1	...	76.2
Dec.	...	76.7	...	60.5	...	96.9



Malleable Iron Castings

(Net tons in thousands)

	Shipments		Unfilled Orders*	
	1949	1948	1949	1948
Jan.	71.9	77.7	126	208
Feb.	66.7	75.2	118	209
Mar.	72.1	86.8	102	203
Apr.	61.3	80.6	95	200
May	54.6	76.1	79	192
June	59.6	81.7	70	179
July	44.4	64.9	71	180
Aug.	58.1	73.3	61	177
Sept.	60.5	77.8	58	164
Oct.	...	81.8	...	155
Nov.	...	77.2	...	146
Dec.	...	79.9	...	137
Total	...	933.1	...	...

* Castings for sale.

HARP rise of the steelmaking rate resulted in TEEL's industrial production index for the week ded Nov. 19 climbing 22 points over the level of e preceding week to 145 per cent (preliminary) of e 1936-1939 average. Despite the sizable gain in e latest week, the index is still 16 points below the vel of the last prestrike week and 32 points below e corresponding week in 1948.

TEEL—With most of the nation's steel producers ck to work the ingot rate for the week ended ov. 19 jumped to 56 per cent of capacity from 24 r cent in the preceding week. Another healthy crease is expected in the current week up to a point ightly below the last prestrike week.

UTOMOBILES—Although the steel strike is just memory for most basic steel producers, its effects e still being felt by the automobile industry. Strike ss to the industry is placed at about 475,000 hicles, based on the amount of vehicles now ex-cted to be built in 1949 as against the volume that uld have been achieved had there been no strike. ne estimated total consists of 425,000 passenger rs and 50,000 trucks. In the week ended Nov. 19 tturn was 115,683 units, up about 800 over the 4,856 assemblies in the preceding week. Effects the steel strike, end of 1949 model runs and the anksgiving holiday suspension will cause assemblies r the current week to drop sharply. Outlook for ecember production is not too bright. Assemblies the last month of this year are expected to total about 350,000 passenger cars and trucks with full scale production deferred until after the first of next year.

COAL—Resumption of coal mining during the week ended Nov. 12 resulted in a gain in bituminous coal output to 7.1 million net tons from 2,680,000 tons in the preceding week. Miners worked three days in mines that had been strike bound to effect a gain of about 4.5 million tons over the average for the strike period.

CONSTRUCTION—Ending a six-week slump, civil engineering construction volume rose to $217,758,000 in the week ended Nov. 17 for the fourth largest weekly contract total for the year to date. During the preceding six-week period weekly awards averaged only $139 million. Private construction for the week was $117,449,000 and public construction was $100,309,000.

RAILROADS—Class 1 railroads installed 1577 locomotives in the first ten months of 1949, the greatest number for any corresponding period since 1923, says the Association of American Railroads. The number put in service so far this year includes 1524 diesel and 53 steam locomotives. On order on Nov. 1 were 812 diesel, 17 steam and 4 electric locomotives.

PRICES—Bureau of Labor Statistics wholesale price index was unchanged in the week ended Nov. 15 at 151.5 per cent of the 1926 average. It is currently 0.4 per cent below 4 weeks ago and 7.6 per cent below the comparable week of 1948.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	56.0	24.0	9.5	99.0
	Electric Power Distributed (million kilowatt hours)	5,450‡	5,435	5,430	5,627
	Bituminous Coal Production (daily av.—1000 tons)	1,183	447	398	2,062
	Petroleum Production (daily av.—1000 bbl)	5,150‡	5,185	5,072	5,690
	Construction Volume (ENR—Unit $1,000,000)	$217.8	$111.3	$121.5	$123.2
	Automobile and Truck Output (Ward's—number units)	115,683	114,856	143,049	120,718
	*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons. ‡Preliminary.				
TRADE	Freight Car Loadings (Unit—1000 cars)	725†	636	589	857
	Business Failures (Dun & Bradstreet, number)	190†	222	181	126
	Money in Circulation (in millions of dollars)‡	$27,397	$27,528	$27,427	$28,215
	Department Store Sales (changes from like wk. a yr. ago)‡	—9%	—2%	—12%	—9%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$12,916	$11,234	$15,216	$13,423
	Federal Gross Debt (billions)	$256.9	$256.8	$256.6	$252.5
	Bond Volume, NYSE (millions)	$20.6	$12.2	$15.9	$16.3
	Stocks Sales, NYSE (thousands of shares)	7,420	4,317	6,628	5,176
	Loans and Investments (billions)†	$66.7	$66.7	$66.2	$62.4
	United States Gov't. Obligations Held (millions)†	$37,042	$37,388	$37,300	$33,319
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	152.52	152.52	152.52	151.86
	STEEL's Nonferrous Metal Composite‡	169.3	171.6	169.1	232.3
	All Commodities†	151.5	151.5	152.1	164.0
	Metals and Metal Products†	169.4	169.3	169.2	173.6
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

Men of Industry

STEPHEN C. MAY

W. E. LUNGER

JOHN S. ROLLER

Stephen C. May has been named vice president and general sales manager of **Blackmer Pump Co.,** Grand Rapids, Mich. Mr. May formerly served as consulting sales counselor with Auto-Soler Co., in sales executive capacities with Pacific Mfg. Corp. and Iron Fireman Mfg. Co., and as vice president and sales manager of Darling Valve & Mfg. Co.

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Melvin O. Monsler has been appointed sales manager, P & H Welding Division, **Harnischfeger Corp.,** Milwaukee. He has been associated with the company for 12 years, serving for four years as assistant sales manager of the division, and one year as welding product service engineer. He is succeeded by **A. G. Hendrickson** as assistant sales manager of the welding division. Mr. Hendrickson formerly was a welding engineer in the Milwaukee-Minneapolis territory.

—o—

Metal & Thermit Corp., New York, has appointed **Bernard W. Weber** manager of its detinning and electrode manufacturing plant at East Chicago, Ind. He formerly was manager of the Seattle plant of American Can Co. **W. S. Leinhardt,** formerly general superintendent, East Chicago plant, is now at Metal & Thermit's executive offices in New York as technical assistant to the vice president of production. **William C. Cuntz,** manager, Pittsburgh sales office and warehouse, has been made district manager at Chicago. **Orville T. Barnett,** manager, Newark, N. J., office, has been appointed Pittsburgh district manager. **Robert T. Brown,** who headed technical service on both electrodes and Thermit, has been made district manager at Newark.

W. E. Lunger, district manager of the Huntington, W. Va., plant of **American Car & Foundry Co.,** has been appointed assistant vice president in charge of production, with headquarters in New York. **J. E. Koontz,** assistant district manager at the Huntington plant, succeeds Mr. Lunger as manager.

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Harry C. Bickler has been elected secretary and treasurer of **Globe Steel Tubes Co.,** Milwaukee. He succeeds **George O. Ross,** retired after 27 years' association with the company. Mr. Bickler has been with Globe Steel Tubes since 1922, starting as a cost clerk, and subsequently becoming chief clerk of the accounting department, and in 1928, assistant treasurer. **Joseph S. Nigrelli,** former works accountant, was elected to succeed Mr. Bickler.

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B. Thor Bjornstad has been named district engineer in the Pacific Northwest by **Austin Co.,** Cleveland. He joined the company as a structural engineer on its special staff at Sand Point Naval Station in 1940.

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Fred L. Hopf, sales manager, Wausau, Wis., **Dynamatic Corp.,** division of Eaton Mfg. Co., Cleveland, has been named general manager of the Wausau plant, succeeding **Charles Hayes,** resigned.

—o—

William C. Burton has been appointed Pacific district sales manager for the American Manganese Steel Division of **American Brake Shoe Co.,** New York. **Robert H. Elem** also was appointed Pacific Coast manager, welding products department.

John S. Roller has joined **Repub Supply Co.,** Houston, as gene manager of sales. He formerly w assistant sales manager of the B mingham district for Republic St Corp. **Don L. Collins,** formerly e ecutive vice president and gene manager of sales, will continue duties as executive vice preside for Republic Supply Co.

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T. F. Wilson has been appointed ma ager of the operating supplies di sion, **American Car & Foundry Co** purchasing department. He has be with ACF since 1916, and replac **G. E. Thompson,** resigned.

—o—

Elmer F. Franz has been elected tre surer, **Yale & Towne Mfg. Co.,** N York, succeeding **Fred Dunning,** tre surer since 1933, who will devote f time to his increased responsibiliti as executive vice president and sec tary. Mr. Franz resigned as com troller of Weatherhead Co., Clevela with which he was associated for t last seven years.

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L. H. Perry has been named to he the hydraulic department, **Holyo Machine Co.,** Holyoke, Mass. He fo merly was with James Leffel & C Springfield, O., as mechanical en neer, designing hydraulic turbines f both government and private pow plants, and prior to that was wi Charles T. Main, engineer, Bost supervising the design of hydrau and mechanical equipment for gover ment power plants. He also had be hydraulic engineer, water wheel d partment, Rodney Hunt Machine C

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Harold Anschuetz has joined the st of **Ken Cook Co.,** Milwaukee, as pr

TINNERMAN
Speed Nut
SAVINGS STORIES

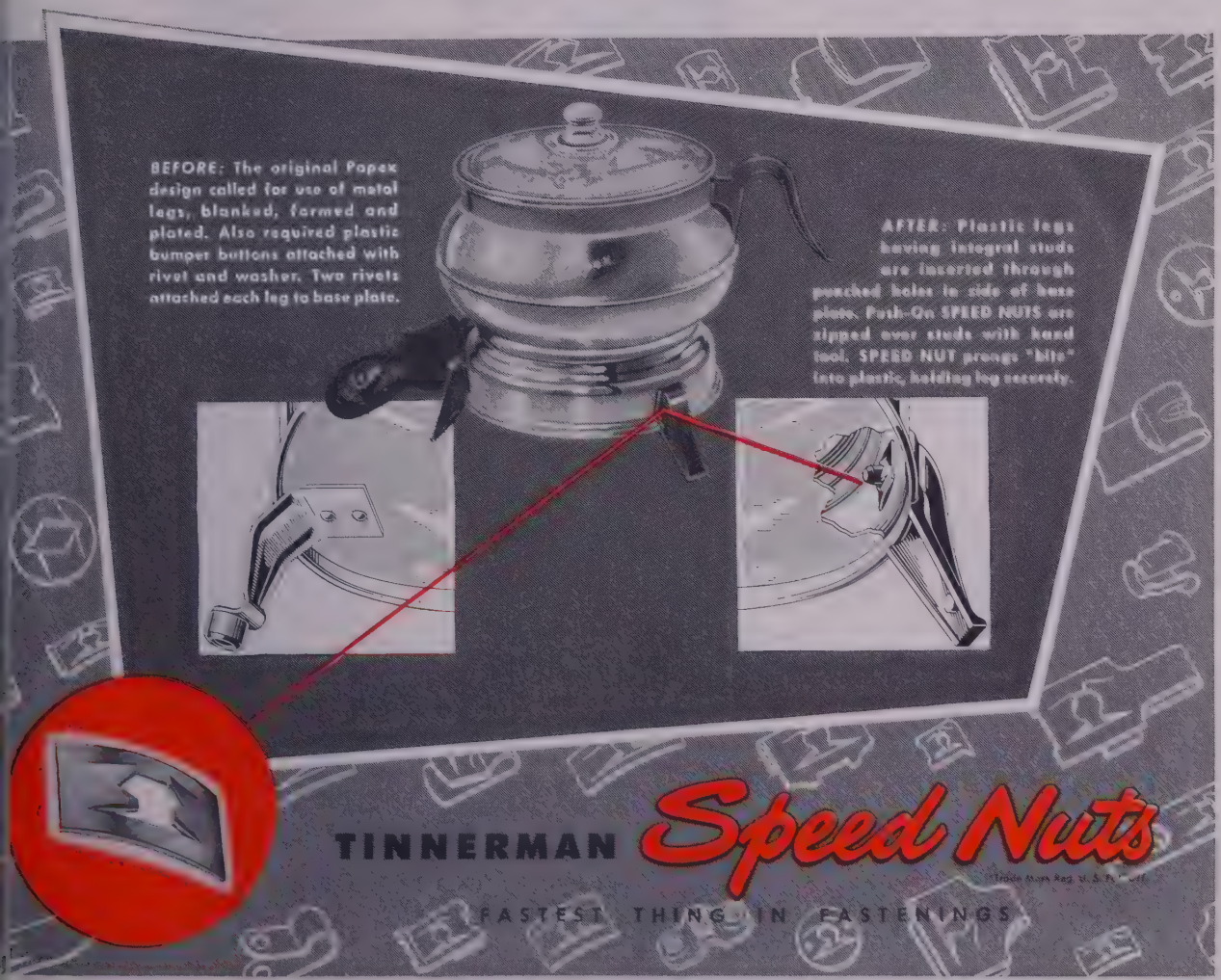
"Popcorn and Push-Ons"

. . . a story of product redesign using 4 Push-On Type SPEED NUTS to eliminate 14 operations . . . cut material costs 30%!

How to keep the "lid" on the retail price of their new, distinctive popcorn popper was a problem faced by Popex, Inc., Cincinnati, Ohio.

This meant watching production costs carefully. For instance, the cost of attaching the metal legs to the base seemed out of line. Alternate methods were considered, and Push-On Type SPEED NUTS combined with plastic legs provided the best, fastest and most economical solution. This combination eliminated 14 assembly operations and reduced material costs 30%!

From popcorn poppers to passenger cars, SPEED NUT brand fasteners are proving their value—in faster, easier assembly, lower costs and better product design. A Tinnerman Fastening Expert can show you how to gain these benefits. Contact him by phone. Also, write for your copy of SPEED NUT Savings Stories—actual case histories of cost savings. TINNERMAN PRODUCTS, INC., 2040 Fulton Road, Cleveland 13, Ohio. In Canada: Dominion Fasteners, Ltd., Hamilton.


BEFORE: The original Popex design called for use of metal legs, blanked, formed and plated. Also required plastic bumper buttons attached with rivet and washer. Two rivets attached each leg to base plate.
AFTER: Plastic legs having integral studs are inserted through punched holes in side of base plate. Push-On SPEED NUTS are slipped over studs with hand tool. SPEED NUT prongs "bite" into plastic, holding leg securely.
TINNERMAN Speed Nuts
FASTEST THING IN FASTENINGS

duction engineer. He previously was with Falk Corp.

—o—

General Electric Co., apparatus department, Schenectady, N. Y., has promoted **Neil Currie Jr.** from manager of manufacturing to administrative assistant to the general manager; **Ernest E. Johnson,** from manager of engineering to manager of engineering, large apparatus divisions; **Carl A. Salmonsen,** from manager, aircraft gas turbine divisions, to manager of manufacturing, large apparatus divisions; **Byron A. Case,** from assistant to manager of engineering, to manager of engineering, small apparatus divisions; **Frank T. Lewis,** from manager of manufacturing, aeronautic and ordnance systems divisions, to manager of manufacturing, small apparatus divisions; **Clarence H. Linder,** from assistant manager of manufacturing to assistant to the general manager; and **C. W. LaPierre,** from assistant manager, aircraft gas turbine divisions, to manager of that division.

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Joseph Harwood was named to manage the brake shoe division, **Pick Mfg. Co.,** West Bend, Wis., and will have headquarters in the company's Detroit office. He formerly headed the bonded brake shoe division of LRC Co., Detroit.

—o—

Kenneth F. Ode has been appointed manager, Findlay Division, **Gar Wood Industries Inc.,** Wayne, Mich. He has been works manager, Trackson Co., Milwaukee.

—o—

Joseph Druliner has been appointed chief industrial engineer of **Northrop Aircraft Inc.,** Hawthorne, Calif. He previously was chief industrial engineer and factory superintendent for Consolidated Vultee Aircraft Corp. in San Diego, Calif., and was manager of the industrial engineering department, Lockheed Aircraft Corp., Burbank, Calif. More recently he was employed in the industrial engineering department, Douglas Aircraft Inc., Santa Monica, Calif.

—o—

Gulf Oil Corp., Pittsburgh, general sales department, has appointed **John F. Walton Jr.** general sales manager of special accounts and federal government sales of all products; **John P. Knight,** assistant general sales manager; **L. F. Craig,** general sales manager of special products; **R. C. Arnold,** general sales manager of extra-divisional market development; **M. J. St. Clair** has been named administrative assistant to assist **R. M. Bartlett,** vice president of general sales, in the company's general sales program. Named regional managers in the general sales department are **R. B. James,** Boston; **John Pennywitt,** New York; **J. A. Guyton,** Jacksonville, Fla.; and **H. P. Roby,** Chicago.

—o—

E. S. Wayland, vice president in charge of sales, **American Brass Co.,** Waterbury, Conn., will resign Jan. 1 after 34 years' association with the company. He is a director of Waterbury Buckle Co. and Eastern Malleable Iron Co.

—o—

Douglas Dalton has retired as assistant general manager, Stamford Division, **Yale & Towne Mfg. Co.,** at Stamford, Conn., after 34 years of service. He will continue in a consulting capacity.

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Otto Doerner has been elected vice

OTTO DOERNER

president in charge of manufacturing and engineering, **Cummins Business Machines Corp.,** Chicago. He will be responsible for production and engineering activities of the portable tool division as well as those of the business machines division. Before joining Cummins more than two years ago, Mr. Doerner was with National Cash Register, Zenith Radio and International Register.

—o—

S. R. Francis, founder of **Metals & Alloys Ltd.,** Toronto, Ont., Canada, has relinquished the directive management of the business but continues in an active consultant capacity as chairman of the board. **F. J. Francis,** formerly vice president, has been elected president and general manager. **E. G. Jennings,** sales manager, has been named vice president and general sales manager.

—o—

W. M. Bellemore has been named ballistic engineer at **Winchester Repeating Arms Co.,** New Haven, Co succeeding **Merton A. Robinson,** tired after 45 years of service.

—o—

Harris Fiestal, formerly New Y district manager of Charles Dre Co., has announced formation of H **ris Fiestal Co.,** with offices at Broadway, New York. The new f will engage in scrap brokerage new steel distribution. Associa with Mr. Fiestal will be his son, H **ry Fiestal, Frank Fry** and **Robert Himelfarb.** Mr. Fry and Henry stal will assist in the scrap brok age works, and Mr. Himelfarb concentrate on new steel sales.

—o—

Speedi-Dri Corp., Washington Squ Philadelphia, is a new firm hea by **R. H. Hubbell Jr.,** president; W **ren E. Sawyer Jr.,** vice presid secretary and treasurer; and **R. Hogan,** sales manager. It will m ket oil and grease absorbents kn as Speedi-Dri and Sol-Speedi-Dri the New England states, New Yo eastern Pennsylvania and part New Jersey. All sales will be ha led by the New York office, No Wall St.

—o—

H. Gordon Smith has been named cific district sales manager of appliance and merchandise dep ment of **General Electric Co.,** Sc nectady, N. Y.

—o—

Frank R. Plum has been name dir tor of sales, **American Machine Foundry Co.'s** bakery division, N York. He joined the company years ago as a member of the bak division sales organization. Mr. Pl succeeds **Martin Miller,** resigned.

—o—

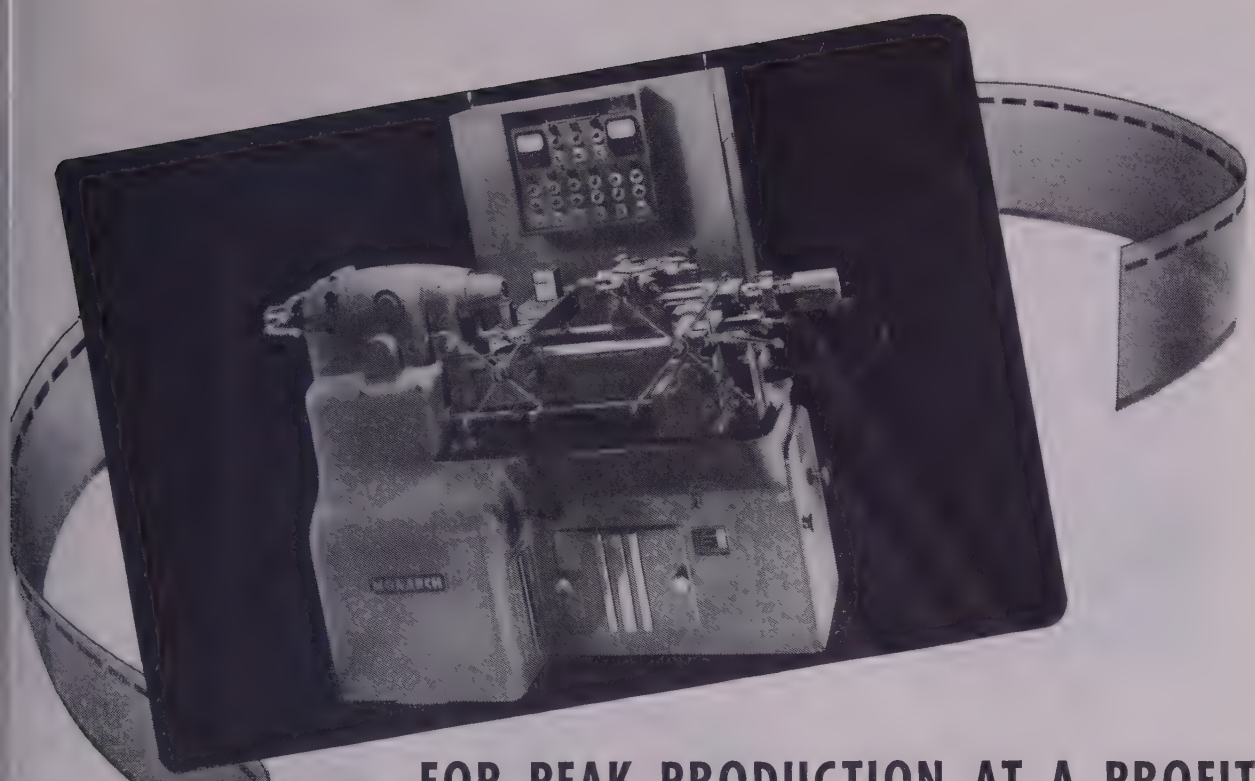
Walter A. Mogensen, vice presid and treasurer of **Avco Mfg. Co** New York, has been named a direc of the corporation. **James D. Sho** was elected a member of the exe tive committee, and **William Werner** was elected a vice preside

—o—

Chemical Corp. of Springfield, Ma announces that **John Kosmos,** a me ber of the Electrochemical Soci and the AES, has joined its staff technical service man, heading new laboratory and available for c sultation on the metal finishing pr lems of its customers. Mr. Kosm has been actively engaged in ma rial control, process control, met lurgy and metallography with su companies as Pratt & Whitney a Underwood.

—o—

Gaylord Poeschl has been appoint plant engineer for **Heil Co.,** M waukee. Formerly engineer at He



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SIDNEY, OHIO

"World's Fastest Hand Screw Machine"—that's what metal turning experts, everywhere, are calling the Monarch *Speedi-Matic*. It operates so fast, so accurately you have to see it to appreciate it.

Because you may not be able to spare the time for a trip to Sidney to see the *Speedi-Matic* demonstrated in our own showrooms, we've put its operation on film, ready to perform for you in your own office or assembly hall.

Into the brief space of twenty-three minutes we've packed eleven complete examples of its time-saving, money-saving performance on typical steel and bronze screw machine parts. And there's enough description of the *Speedi-Matic's* outstandingly unique design features to explain why it can make "peak production at a profit" a reality in your shop.

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Organization _____

My Name_____ Title_____

Street Address_____

City_____ State_____

he succeeds **Ray Leary,** who recently was selected as chief engineer and general manager of City and Metropolitan Sewerage Commission, Milwaukee.

—o—

L. B. Taylor has been appointed gen-

L. B. TAYLOR

eral sales manager, **Friden Calculating Machine Co. Inc.,** San Leandro, Calif. He has been serving as the company's domestic sales manager.

—o—

Raymond J. Shillum has been elected a member of the board of directors and appointed vice president in charge of sales, **Brown-Hutchinson Iron Works,** Detroit. He was sales manager directing the alloy sales division. Mr. Shillum has been with Brown-Hutchinson two years and was formerly with the metallurgical and heat treating division of Ford Motor Co. for 25 years.

—o—

Walter A. Kesterke has been appointed sales representative for industrial grinding wheels in Wisconsin and southwest Michigan for **United States Rubber Co.,** New York. He has had 20 years' experience in malleable iron and steel foundries, having been foundry superintendent of Edgewater plant, Auto Specialties Mfg. Co., and foundry engineer with Benton Harbor Malleable Industries at Benton Harbor, Mich. He will have headquarters in Milwaukee.

—o—

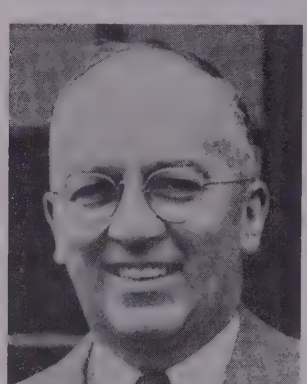
National Electrical Manufacturers Association, New York, announces new elections: **C. T. Lawson,** vice president in charge of sales, Kelvinator Division, Nash-Kelvinator Corp., Detroit, was elected president, succeeding **B. W. Clark,** vice president of sales, Westinghouse Electric Corp., Pittsburgh. **C. W. Higbee,** manager, electrical wire & cable department, U. S. Rubber Co., was elected vice president, as were **J. H. Jewell,** vice president, Westinghouse Electric Corp.; **James F. Lincoln,** president, Lincoln Electric Co., Cleveland; **E. E. Potter,** vice president, General Electric Co., New York; and **A. F. Sheldon,** vice president and general manager, Kennecott Wire & Cable Co., Phillipsdale, R. I. **Everett Morss,** president and treasurer, Simplex Wire & Cable Co., Cambridge, Mass., was elected treasurer.

—o—

J. O. Clevenger has been appointed manager of the welding department, **Westinghouse Electric Corp.,** Pittsburgh. In 1939 Mr. Clevenger became manager of the construction and communication section. He was transferred to Atlanta as manager of agency and specialty sales for the southeastern district in 1947, and was located there until recently.

—o—

A. M. Shaw has been appointed as-



A. M. SHAW

sistant manager, pump and compressor merchandising division, **Worthington Pump & Machinery Corp.,** Harrison, N. Y. He will be responsible for development of pump and compressor sales to original equipment manufacturers. His activities will come under supervision of **J. O. Glenn,** manager of the division.

—o—

Irving G. Meyer has been named consumer sales manager, and **John Stolarz,** manager of Multiplex sales for Power Tool Division, **Rockwell Mfg. Co.,** at Milwaukee. Mr. Meyer, affiliated with the division since 1942, was assigned in 1945 to the Pacific Northwest territory as district sales manager with headquarters in Seattle. He returned to Milwaukee in 1949 to head the new consumer sales department. Mr. Stolarz resigned from De Walt Inc. in August to join Rockwell. He served with the former company as sales manager in charge of export work, sales promotion and adver ing, as well as sales.

—o—

F. P. Taugher has been appoin manager of engineering, indust control division, **Westinghouse E tric Corp.,** at Buffalo. He has b engineering and service manager the company's New England dist for the last five years. **M. L. Gard** was appointed engineering and se ice manager in New England, w headquarters in Boston, succeed Mr. Taugher.

—o—

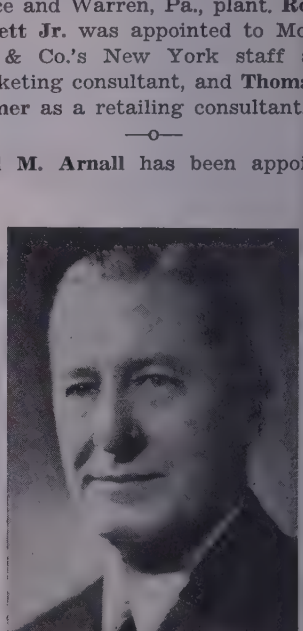
R. W. Kimberlin has been appoin San Francisco district manager **Graybar Electric Co.,** New York, s ceeding **J. P. Carson,** who will re Jan. 1 on the company's service p sion. Mr. Kimberlin has been Louis district manager, and has b associated with the company years, 24 of which have been sp in the San Francisco district. **C. Powell** has been appointed to s ceed Mr. Kimberlin in St. Louis. has been in charge of telephone, dio and appliance sales in the c pany's general department.

—o—

McKinsey & Co., management c sultant, New York, announces pointment of **Robert P. Neuschel** its New York staff as a consult in manufacturing. Mr. Neuschel been with Sylvania Electric Produ Inc. since 1947, both in its New Y office and Warren, Pa., plant. **Rob Jerrett Jr.** was appointed to McK sey & Co.'s New York staff a marketing consultant, and **Thomas Palmer** as a retailing consultant.

—o—

Paul M. Arnall has been appoin



PAUL M. ARNALL

vice president and general mana of **Lunkenheimer Co.,** manufactu in Cincinnati of valves and engine ing appliances and will assume dut Jan. 3, at which time manage

anization will consist of **Frank P. ame,** president; **Paul M. Arnall,** e president and general manager; rry **A. Burdorf,** vice president- es; **Edmund P. Lunken,** vice presi- t; **Chester C. Isekeit,** treasurer; **Charles W. Burrage,** secretary.

—o—

A. Silverman has been elected sident and general manager, **Vilter** g. **Co.,** Milwaukee. He succeeds **E. Tilton,** president, general manager treasurer, who remains as man- ment consultant. Mr. Silverman previously vice president. **B. J. dl** has been elected vice president charge of manufacturing, and **M. Grady,** comptroller, was elected asurer.

—o—

eph A. Russell, freight traffic nager, **Erie Railroad,** in Chicago, been appointed to the newly ated position of western traffic nager. His headquarters will be os Angeles.

—o—

I. Weingast has been elected pres- t and general manager of **Pre- on Apparatus Co. Inc.,** Elmhurst, ens, N. Y., maker of test equip- t for all phases of radio-electron- He formerly was secretary- surer and director of purchasing. **N. Goldberger,** formerly chief en- er, was appointed vice president harge of engineering and treas- r; **J. M. Kirschbaum,** elected vice ident in charge of sales; and **S. Weingast,** named secretary and tor of purchasing.

A. J. LAPOINTE

A. J. Lapointe, a veteran of 25 years in chemical engineering research, has been appointed manager of the process engineering laboratory of **Lincoln-Mercury Division,** Ford Motor Co., Detroit. He spent several years in Detroit developing automobile finishes for a number of car manufacturers. He resigned as technical director of Egyptian Lacquer Mfg. Co., South Kearny, N. J., to join the Lincoln-Mercury division.

—o—

Eric Dudley has been named manager of aviation development and manager of the Pacific Coast district of **Tinnerman Products Inc.,** Cleveland. Mr. Dudley, who has served since 1946 as a sales engineer in the Tinnerman Detroit office, was active from 1930 in the development of military aircraft. Prior to joining Tinnerman organization in 1946, he was production manager of Boots Aircraft Nut Corp., Stamford, Conn., and before that was assistant to the director of engineering for Curtiss-Wright Corp., aviation division, Columbus, O. In his new position he will have headquarters in Los Angeles.

—o—

Creston E. Kite has been named general manager, **Unistrut Eastern Service Co.,** Irvington, N. J. He formerly was vice president in charge of sales, General Alloys Co., Boston. The service company is a branch of Unistrut Products Co., Chicago, specializing in metal framing used extensively in the construction industry. Mr. Kite, in addition to managing the warehouse operation, will supervise sales, service and engineering for Unistrut's new eastern branch.

—o—

Paul A. Girod has been appointed resident salesman in the Philadelphia office of **Berger Mfg. Division,** Canton, O., Republic Steel Corp. He worked in the Berger general sales department six months before entering the armed services, and after three years returned to Berger as a sales trainee.

—o—

H. V. Churchill, chief of the analytical chemistry division of the New Kensington, Pa., research laboratories, **Aluminum Co. of America,** Pittsburgh, has been selected to receive the 1949 Pittsburgh Award by the Pittsburgh section of the American Chemical Society.

OBITUARIES...

iam H. Sharpe, 50, sales produc- manager, **Rome Cable Corp.,** died . 16 at Rome, N. Y. He previously associated with General Cable in Buffalo, and was one of the ders of Rome Cable Co.

—o—

el A. Simon, 66, industrialist, died 17 at his home in Beverly Hills, a. For 25 years he was president, **uesne Smelting Corp.,** Pittsburgh. e also was chairman of the board General Armature Corp. and rican Forge & Mfg. Co., and vice dent and director of Copperweld e Co. He was a member of the Ferrous Metal & Ingot Institute he United States and secretary alk Foundation for 20 years.

—o—

el B. DeLand, 64, assistant to the president in charge of manufacturing, **American Can Co.,** New York, died Nov. 14.

—o—

Harry R. Donald, 67, active in the foundry equipment supply business in Milwaukee for nearly 40 years, died Nov. 15 of a heart attack. He helped organize the **Interstate Supply & Equipment Co.,** Milwaukee, in 1929, and since 1931 served as its president.

—o—

Frank M. Smith, 68, general service manager, **Monroe Calculating Machine Co.,** Orange, N. J., died Nov. 16.

—o—

George H. Knebusch, 66, for 20 years plant superintendent, **Cleveland Steel Tool Co.,** Cleveland, died Nov. 17. He retired a year ago.

—o—

Eugene H. Pfeiffer, 52, plant manager of the Rochester, N. Y., branch of **Brace, Mueller & Huntley,** steel products, died Nov. 18. He formerly was manager of the Buffalo plant of the firm, and was transferred to the Rochester plant five years ago.

—o—

Frank J. Tollon Sr., 77, founder and treasurer, **American Boiler Works,** Erie, Pa., died of a heart attack Nov. 16. He founded the firm over 40 years ago.

—o—

Charles A. Brauchler, 82, president and general manager, **Canton Drop Forging & Mfg. Co.,** Canton, O., died recently.

—o—

Joseph R. Freifield, 57, secretary, **State Metals & Steel Co.,** Canton, O., died Nov. 13 following a heart attack.

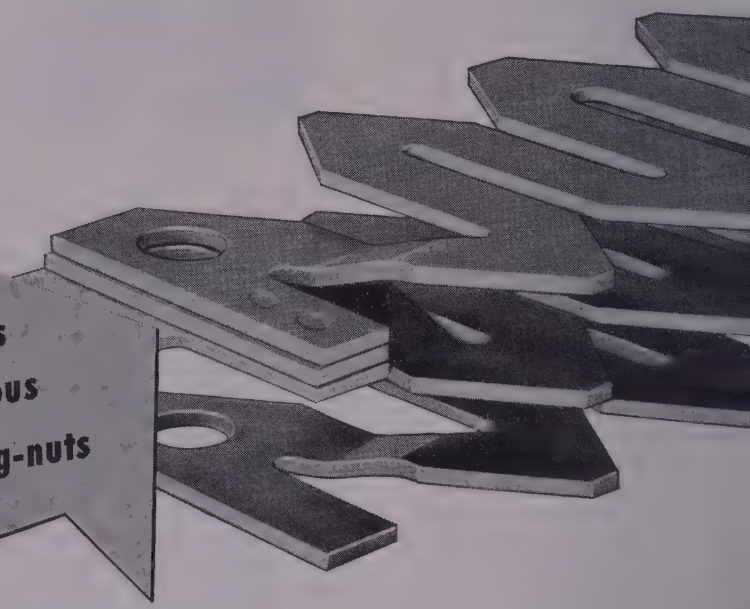
—o—

Robert F. Crudginton, 68, industrial engineer and former works manager, **Underwood-Elliott-Fisher Co.,** Bridgeport, Conn., died of a heart attack in Harrisburg, Pa., Nov. 13.

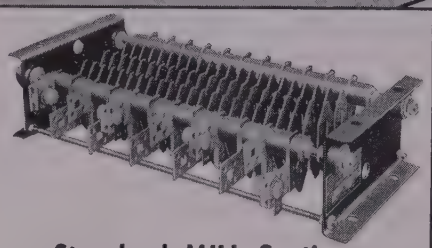
Two-way Improvement with EC&M TAB-WELD Resisto

1 - STABILIZES the resistance value.

2 - ELIMINATES TROUBLE in concealed area



OFF-SET in each plate gives Intimate Contact at grid-eyes SPOT-WELDS insure continuous path independent of clamping-nuts



Standard MILL Sections have these features . . .

1. All grids in series—all grids of the same size.
2. Capacities up to 150 amperes per section. External paralleling of sections for larger capacities as needed.
3. Uniform mounting-hole dimensions.
4. Replacement simplified — taps in place for affixing external leads.

Usually mounted overhead or in other remote locations, electrical resistors often receive little inspection or preventative maintenance until the damage has been done. But now, the problem of burning at grid-eyes, at tap-plates, and the need for periodic tightening of clamping-nut pressure is eliminated with EC&M *TAB-WELD* Plate Resistors.

Unlike previous resistor-sections depending on end-nuts for contact-pressure, these new EC&M Resistors are designed with *Tab-ends* which are spot-welded to give a *continuous* path throughout each section. Tap-plates also, are welded in position at frequent intervals for affixing external leads. Only EC&M *TAB-WELD* Plate Resistors offer these improvements for lower up-keep—prolonged life. *And don't overlook the corrosion-resistant properties of these steel plate resistors.*

When replacing existing installations or making new layouts, use EC&M Bulletin 942 *TAB-WELD* Plate Resistors

THE ELECTRIC CONTROLLER & MFG. CO

2698 EAST 79TH STREET • CLEVELAND 4, OHI

Production and Engineering
NEWS AT A GLANCE

VORM'S EYE" INSPECTION— On - the - line inspection ployed in Hotpoint's Chicago electric range finishing plant mbines both visual and electric thickness gage checking. the body inspection line, a mirror mounted at an angle on e floor enables the inspector to see the "toe plate" at the ttom edge of the range body. All front door panels are lor matched, both visually and with the photo-electric re- ctance reading equipment. Thickness of enamel coatings checked with an electric thickness gage both before and er firing. If, during this process, parts are detected to be er 18 thousandths in titanium enamel and over 25 thou- ndths in zirconium enamel they are rejected.

AST CLEANING ACTION— Besides faster cleaning, a new pper shot developed by American Wheelabrator & Equip- ent Corp., Mishawaka, Ind., for blast cleaning and finish- g nonferrous parts, imparts a lustrous, brilliant, almost rnished finish of natural color to the work. Made from re copper ingot with only a small amount of copper phos- orous deoxidizer added to insure soundness, the shot pro- des practically no plating effect of the copper on the work. uminum castings, for example, retain an aluminum color th only a slight, if any, orange tinge.

O HANDLE LONGER BILLETS— New heating furnace ted for the skelp mill of the new Indiana Harbor tube mill Youngstown Sheet & Tube Co., currently being equipped, designed to accommodate 35-foot billets, and will have a pacity of about 80 tons per hour compared to 30 tons for e present furnace. Charging end is to be completely chanized with new equipment for handling the longer d heavier billets. Thirteen roll stands are to be included the mill proper to permit it to produce skelp from thicker llets. Processing of longer coils will reduce the number of d-welds and minimize hand labor.

ATTER OF GRIT SIZE— When plunge grinding on a cen- less grinder, surface finishes of low microinch rating may obtained by using medium-fine grit wheels. Besides pro- ding the desired finishes, according to *Grits and Grinds*, ch wheels also allow stock to be removed more quickly, re- cing unit grinding cost proportionately. When fine grit heels are used, it is pointed out, the cutting action of the heel is very slow. This lengthens the grinding cycle and ises the cost per piece.

OOM FOR ORIGINAL WORK— Electrodeposition offers way of making alloys which cannot be conveniently pre- red by simply melting together necessary components, larold J. Read, associate professor of metallurgy, Pennsyl- nia State College, pointed out recently. He indicated that o-phase copper-rich alloys of copper and cadmium show omise as bearing alloys, particularly with respect to fatigue sistance and compressive strength. But they are not in- strially usable because of manufacturing difficulties as- ciated with the fact vapor pressure of cadmium is very high the melting point of the alloys. Since it is entirely feasible codeposit these metals, it would appear that important sults should be forthcoming from an investigation along ese lines.

USED BY THE TON—Installation of the furnace bottom in Weirton Steel's 550-ton giant open hearth, which recently went into action, required the use of 178 tons of magnesia refractory. It was a 57-hour project in which materials handling played a leading role. The refractory was mixed with water in concrete mixers and carried into the furnace by a bulk conveyor. Seven pneumatic rammers, operating under 75 pounds per square inch air presure, were kept in continuous action. (p. 56)

FAST ACTION—A single press that performs seven operations on about 7000 pieces per 8-hour day is employed in turning out rear lamp bodies for Ford cars. In the operation, blanks for the bodies are stacked for delivery to the press. The latter which is equipped with seven individual dies set side by side operates in a progressive manner. It makes use of transfer bars that move each part from cavity to cavity until it is ejected after the seventh operation. Blanks are magazine fed. (p. 60)

THE "LOOP" FACTOR—In designing a jig or fixture for a welding job, the designer must keep certain fundamentals in mind. At the outset, all magnetic materials must be kept out of the loop which, in a spot welder, is the gap surrounded by the upper and lower arm, electrodes and base of the machine housing the transformer. (p. 62)

"TAILOR-MADE" ORES — Concentration is becoming more and more important, it is pointed out, as high-grade ores of the Mesabi are exhausted. But this does not mean that cost of producing iron and steel will necessarily increase because of the higher costs of producing the ore. Recent tests in smelting high-grade, agglomerated, magnetic taconite indicated a much lower coke consumption in the blast furnace and a much higher production rate of metal than with standard ores. Processed ores really are "tailor-made" for subsequent smelting operations. While it may cost more to process and prepare the ore, savings that can be realized in transportation and smelting can actually provide cheaper metal in some instances than from ores that are high-grade as mined. (p. 78)

Furnace Bottom

INSTALLE

...In Worl

OPEN-HEARTH refractories are not merely an accessory to the furnace. They themselves are the furnace, to all intents and purposes. Actually, the steel work of the main structure can be called a frame which helps support the refractories, since the production of steel would be impossible without materials capable of resisting temperatures of close to 3000° F.

The largest furnace in the world, Weirton Steel's 550-ton capacity giant, which recently went into operation, took over 4 months to build, and an equivalent period for planning. But the bottom, which is by far the most important single part of the furnace, was completed in a record time of 57 hours.

This unit is a composite of the best features of open-hearth furnaces across the country. By installing a Ramset hearth, Basic Refractories Inc. of Cleveland completed the operation in record time.

Idea of ramming a bottom is almost as old as the basic open-hearth furnace itself. For many years individual operators made and used their own refractory ramming and plastic mixtures with varying success.

Interest of steel operators in this development has always been high, because they anticipated the many benefits to be gained, such as: 1. Ease of installation—relatively unskilled labor could install rammed hearths or repairs, releasing valuable furnace men for actual steelmaking. 2. Control of installation—the exact contour desired for the finished hearth could be obtained with greatest accuracy. 3. Uniformity of installation—no slag or other nonrefractory diluting agent would be required. As a consequence the hearth would have a uniformly high periclase (crystalline magnesia) content. 4. Economy of installation—the time required to install a rammed hearth would be far less than required to "burn in" a hearth of granular magnesia refractory, less fuel would be consumed and the shortened period required for "burning" the rammed hearth would reduce damage to roof, sidewall and other refractories, and hold nonproductive labors to a minimum.

Obstacles Encountered—On the other hand, there were formidable obstacles which discouraged most basic refractory manufacturers from undertaking the development of a practical commercial mix. Among the more serious problems were these: 1. Hydration—known magnesia clinkers were susceptible to the destructive effect of hydration. 2. Strength—chemical bonds were required which would not migrate or radically lower refractoriness, but would impa adequate strength to the refractory structure all temperatures up to those at which a ceramic bo was developed. 3. Density—the magnesia clink should have a high density and be sized so to yiel on installation, a structure of high density. 4. Wor ability—careful control of sizing would insure goo ramming qualities, but to impart controlled plast qualities to magnesia clinker which has a hars nonplastic nature posed a different problem.

In 1939, we introduced to the American steel i dustry the original commercial magnesia rammi refractory. Ramix, as this cold ramming refracto was called, met with instant success. It incorporate in large measure the characteristics essential to successful ramming mix and amply confirmed th benefits steelmakers had projected for a magnes ramming mix. Over a period of eight years, its valu was proved in more than 300 basic open hearths an in a like number of electric furnace bottoms. A pr gram of further research resulted in the introductio of Ramset, an improved version.

Water Activates Chemical Bond—A stable, scient fically sized magnesia clinker designed to resist h dration together with chemical bonds is used in th manufacture of this refractory material. It is pr pared for installation in the furnace by addition water which activates the chemical bonds. By vary ing, within prescribed limits, the water addition, can be tempered to yield a mix which will compac readily to a dense, monolithic mass under the impac of air hammers or can be used as a plastic mass fo hot major repairs and to pipe or line tapholes.

Chemical bonds cement the refractory grains to gether at room temperatures and retain their adhesiv action up to the temperature at which component of the clinker itself soften and sinter the grains.

One hundred and seventy-eight tons of this mag nesia refractory were used on the Weirton furnace t form a layer nearly 13 inches thick on the botto at the taphole and 15 inches thick on the ends. Th refractory was mixed with water in concrete mixer and carried into the furnace by a bulk conveyo Seven pneumatic rammers were in constant operatio

Finished bottom measurements were 18 by 58 fee at sill level, 14 by 52 feet, 4 inches at the base o the banks. Bath depth at tap hole is 45 inches.

Bottom Condition Satisfactory—Crews started ram ming the bottom on Sept. 3 at 1:40 p.m. and com

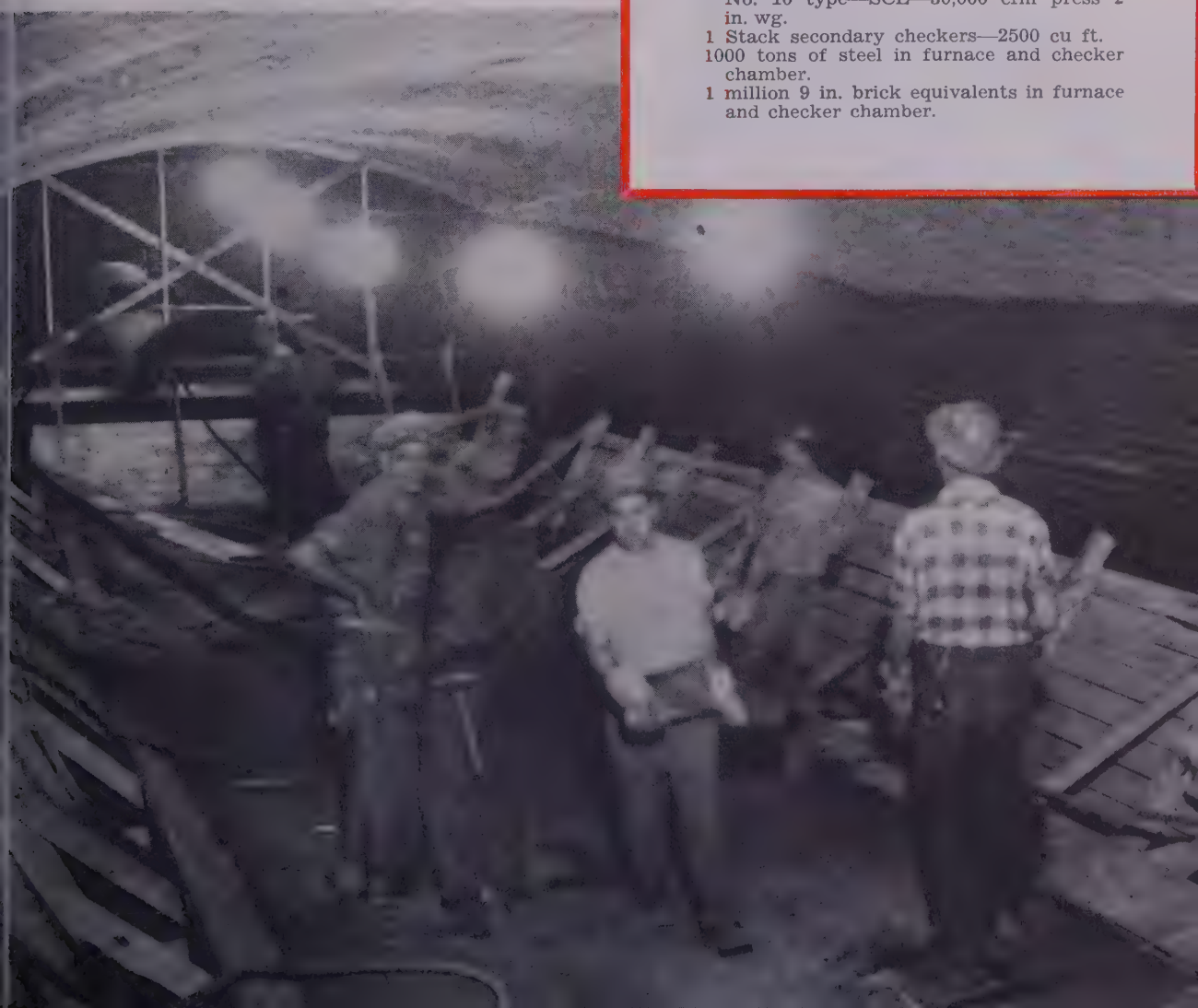
By H. N. BARRETT
Basic Refractories Inc.
Cleveland

IN 57 HOURS

...rgest Open-Hearth

...oint of controversy within the industry today is ...etween the full rammed hearth or the subhearth ...ith a "burned in" top layer. There can be no ...eciding this issue in a month or two. As each ...rocess receives its test of time, the better will rise to diminish the other

Fig. 1—Installing bottom in world's largest open-hearth furnace. Ramming the bottom refractory with pneumatic rammers has shortened installation time from more than 3 weeks to less than 3 days



Weirton Open Hearth Furnace Data

Furnace Proper

Bath size—58 ft long by 18 ft 6 in. wide by 3 ft 9 in. deep.
Overall dimensions—96 ft 6 in. long by 29 ft 3 in. center—24 ft 6 in. ends—height floor to top—15 ft.
Span at center—24 ft 9 in.—3 ft rise.
Slope of back wall—45 degrees.
Doors—7—4 ft 10 in. by 4 ft 7 in.
Port ends are basic brick construction.
Slag pockets are basic—23 ft 8 in. long by 19 ft wide by 13 ft 3 in. high.
Fuel—oil and tar.
Tapping—2—280 ton ladles—2—400 cu ft cinder pots.

Checker Chambers

Volume of checkers—11,300 cu ft each.
Checker brick—12 by 6 by 4 in.—8 x 8-in. opening.
Flue opening—130 sq ft each.
Chamber opening—75 sq ft each.
Flat suspended roof.

Isley Control

2 Stacks—80 ft high by 7 ft 3½ in. diameter.
1 Combustion air fan—40 hp—1200 rpm—No. 8½ type—SL—30,000 cfm press 2 in. wg.
1 Ejecting air fan—100 hp—1200 rpm—No. 10 type—SCL—30,000 cfm press 2 in. wg.
1 Stack secondary checkers—2500 cu ft.
1000 tons of steel in furnace and checker chamber.
1 million 9 in. brick equivalents in furnace and checker chamber.

pleted the job Sept. 5 at 10:50 p.m. The following day, 12 cars of railroad ties were fired to dry out the furnace. On Sept. 8, the oil burners were lighted and the furnace heated to approximately 2950° F in order to "burn in" the bottom. The first heat was tapped at 11:25 a.m. Sept. 9, and condition of the bottom was reported as satisfactory.

The first charge contained 2000 pounds of cold metal, 696,000 pounds of blown metal, 300,600 pounds of cold scrap, 10,000 pounds of ore and 44,600 pounds of limestone. A total weight of 1,009,444 pounds was charged and 915,735 pounds of steel tapped.

Raw steel produced by this giant furnace in one heat is equal in weight to the total amount of steel contained in more than 400 automobiles.

A trend toward complete rammed bottoms or subhearths is apparent from our production records whic show that since 1940 we have installed rammed bo toms in approximately one-third of the furnaces the United States. Of the 307 hearths we install since 1940, only 14 were "burned in," a method whic took up to three weeks to complete. During the wa years of 1943 and 1944 when steel was top priorit we installed 97 bottoms, 70 of which were comple rammed bottoms, while 20 were rammed subhearth

It was first thought that this movement towa the rammed bottom or subhearth was a temporar measure brought about by the period of high produ tion during the war. But as is evident by our i stallation of 38 full rammed hearths and 57 su hearths in the period of 1945 to 1948 as against on 4 "burned in" jobs, the rammer bottom has mature

Installation Supervised by:

D. Bedell Baxter
George W. Edwards

BASIC REFRACTORIES, INC.

O.H. FURNACE #1

RECORD AND LOG OF CONSTRUCTION OF BOTTOM: WEIRTON STEEL COMPANY, WEIRTON, W.VA.

DATE	ADDITIONS TO BOTTOM		MATERIALS USED				FURNACE TEMPERATURE	CORE ANALYSIS SAMPLE ONLY	REMARKS APPEARANCE OF CORE, ACTION ADDITION, SPEED, DENSITY, DELAYS, ET
	TIME STARTED	TIME FINISHED	BASIFRIT	HAMSET	MAGNESITE	SLAG			
1949									
9-3	1:40 PM				Mix 3 qts. water per sack				Installation of complete Ramset
					mixed in 4 and 6-sack batches.				Hearth. 7 Air Hammers and
						Finished Bottom Measurements			concrete mixer used.
						18' 2" x 50' at sill level.			Ramset placed in furnace by
						14' x 52' 4" at base of			means of conveyer. Complete
						banks.			set of forms used. Photographs
						45" Bath Depth at tap hole.			taken.
						11' 6" Center of roof to			
						bottom.			Ramset 13½" at Tap Hole
						6' 3" Bridge Wall to Roof.			Ramset 15½" Ends.
									8" Slope from Front Corners
					Estimate for Bottom Figured from Weirton				to Tap Hole
					Drawing #48630.				6" Slope from Base of Front Bank
									to Tap Hole
									6" Tap Hole Pipe
									Front Bank 10" at Sill Level
									Front Bank 18" at Base
									Back Bank 22" at Sill Level
									due to Back Wall Slope
									Back Bank 18" at Base
									End Banks 12" at Sill Level
									End Banks 18" at Base
									12" Remset on Back Wall taken up
									to Skew Back
9-5		10:40 PM		178 Tons					Flat divided into 5 equal sectio
9-6	3:25 PM		8 Cars of R.R. Ties used Heating Up						Wood Fires Lighted.
9-8	9:30 AM								Oil on Furnace
9-11	8:45 AM	10:00 AM		3000#					Fill Shrinkage Cracks
"	11:00 AM								Began Slagging Bottom
"		2:00 PM			15,000 6 Small Charging Pans				Finished Slagging Bottom
"	4:15 PM								(Tap Slag (10,000# estimated (Drain O.K.
"	4:40 PM								Oil off to Chill Bottom
"	6:00 PM								Oil on Furnace
"	7:30 PM			1000#					Dust Shrinkage Cracks
"	8:15 PM								Oil Off Furnace
"	8:30 PM	9:00 PM							3000# Raw Dolomite on Flat
"	9:15 PM								Began Charging First Heat
"	9:30 PM								Oil on Furnace
9-12	11:25 AM								Tap First Heat
									Condition - O.K.
"	12:30 PM								Began Charging Second Heat
9-13	12:30 AM								Tapped Second Heat
									Condition - O.K.
9-14	1:40 AM								Began Charging Third Heat

Fig. 2 (right) — Record and log of bottom installation for new Weirton open-hearth furnace

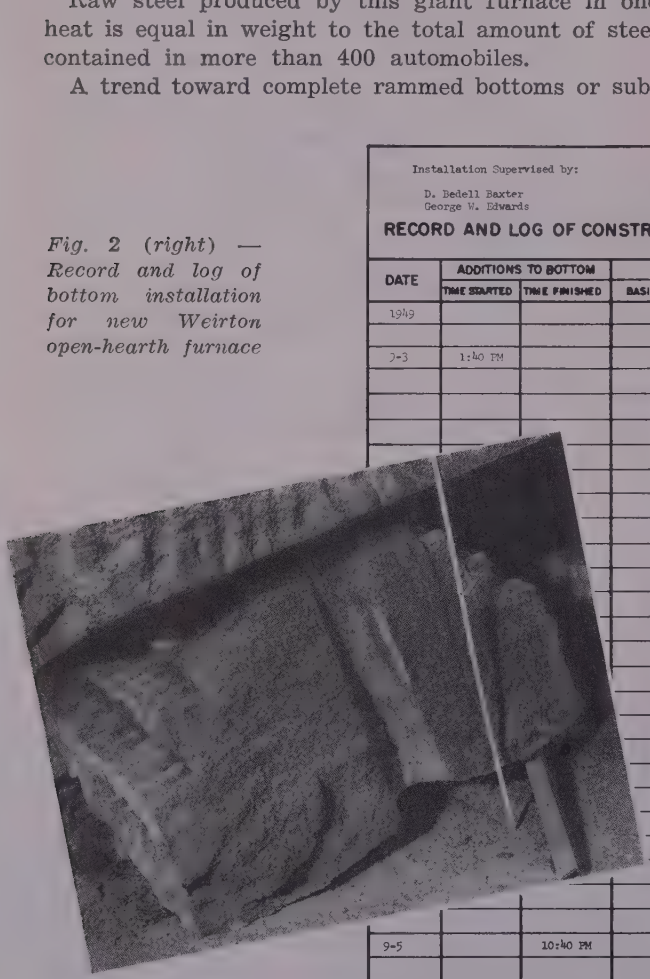


Fig. 3 (above) — View of unused rammed bottom taken from taphole of 60-ton furnace that was installed in Illinois. Photo shows little effect hydration had on the installation. When this furnace was dismantled, the bottom was removed with air hammers about as quickly as it was installed

ACHINE TOOL CO-OPERATION: An interesting ample of how two machine tool companies—each which has developed a specialty—can bring to- ther those specialties in the form of a machine ol of advanced design, is given by Bullard Co. of idgeport, and Cincinnati Bickford Tool Co. of ncinnati.

In connection with its constant effort to cut costs d to improve accuracy in its own shop, Bullard veloped a two-way semiautomatic "spacing table." giving step-by-step, accurate, predetermined spac- , this Man-Au-Trol unit—when mounted under e spindle of a drilling machine—enables the drilling, aming and tapping of a large number of holes to ig accuracy" without jigs and without measure- nts by the operator. Thus repetitive work, even small lots, can be accomplished without running special tool costs and without requiring highly illed operators.

Bullard immediately saw commercial possibilities this device and so also did Cincinnati Bickford, der the spindles of whose radial drills some of e most successful demonstrations were run. The sult has been that Cincinnati Bickford has developed new type of accurate and rigid "column and over- m" drilling machine, literally designed around the llard spacing table and designed to make use of e capabilities of that device to the highest possible gree.

This isn't the first time that a specialty made by machine tool builder has been combined into the sign of another machine tool builder. Precision ndles, for instance, frequently are so merged. How- r, the individual specialties in this Bullard-Cincin- i Bickford case each constitute a major contribu- n to the co-ordinated combination. In that respect e project is unique. It demonstrates that in this y and age of specialization, "two heads are better n one" in the thinking out of a master design. all probability we are due to see more of this kind machine tool co-operation.

OWN AMONG THE GRASS ROOTS: Over many rs that I have been attending meetings of the tional Machine Tool Builders' Association, I have n hearing about ways-and-means for getting the th about private enterprise and the traditional erican way of life spread around "among the ss roots." As far as I can discover, many indus- lists are counting on hiring this job done. Too ny of them have an idea that the conditions down ong the grass roots are not pleasant to anyone o is used to being at a higher level.

f the shop level is considered to be down among grass roots of industry, then I spend considerable e among the grass roots. I always have and I e to do so for a long time to come, because a t amount of common sense and ingenuity and skill l loyalty can be found there. Furthermore, a t amount of inside knowledge about company af- s circulates around among the grass roots. I could te quite an essay on how it gets there and how it interpreted—but not at this time.

What I do want to emphasize is that it is not always

SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

necessary for someone on high to go down among the grass roots with a message. Many loyal workers down there already have these truths and they are doing their level best to transmit them to fellow workers. What they need from above is encouragement to do this in their own way. They don't need "canned" speeches.

One of the finest talks on value and satisfaction of good craftsmanship was delivered to me several months ago by a third generation German-American patternmaker in a big shop in Hamilton, O. He told me that he took every opportunity to deliver that message to young workmen with whom he comes in contact day-by-day.

One of the best talks that I ever heard on the advantages of America was delivered to me not long ago by a Polish-American toolmaker in Milwaukee. "America has been good to me," he said, "and I think it is good for America that I tell these things to many people." These are only two examples of the thousands of plain people who of their own free will are spreading plain truths down among the grass roots. They deserve more recognition and more encouragement from management.

HOW SMOOTH IS SMOOTH? At the recent meeting of American Society of Tool Engineers in Montreal, a session was devoted to fine surface finishes on metal and methods for measuring and comparing degrees of smoothness. Science has become deeply involved in evaluation of surface finish, but the fact remains that the generation of true metallic planes to a high degree of smoothness is an almost primitive process.

Given three castings, a chipping hammer and chisels, some files, red lead or Prussian blue in oil, a set of hand scrapers, and an unlimited patience, a skilled workman can produce accurate, highly finished surface plates in the depths of a wilderness.

One of the most important—and least appreciated—laws of nature, is that by patient chipping, filing and "scraping together" in rotation of three plates, true planes eventually can be generated. Whitworth claimed he discovered this principle, but Nasmyth stated that Maudslay was doing it long before Whitworth's time. I strongly suspect that this basic principle of machine tool building actually was known to prehistoric workers of stone. If so, history repeats itself. We now have stone surface plates.

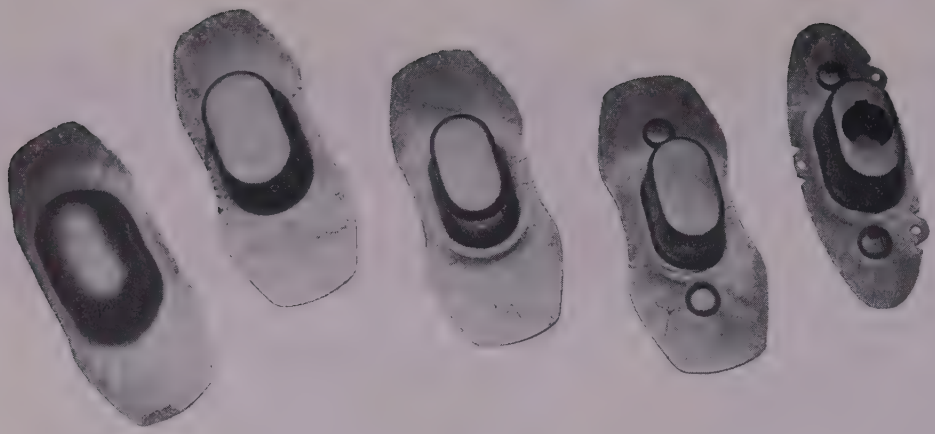
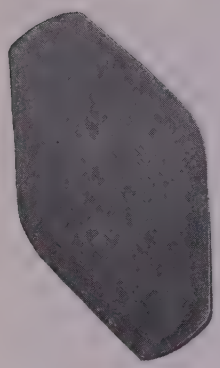


Fig. 1 — Blank and stam ings for Ford tail lamp bo ies as they appear after fi of the six drawing, piercin and trimming operations

By FRANK W. GAWRONS
Flat Rock Plant Manager
Parts & Equipment Mfg. Div.
Ford Motor Co.
Flat Rock, Mich.



HOW FORD STAMPS LAMP PARTS

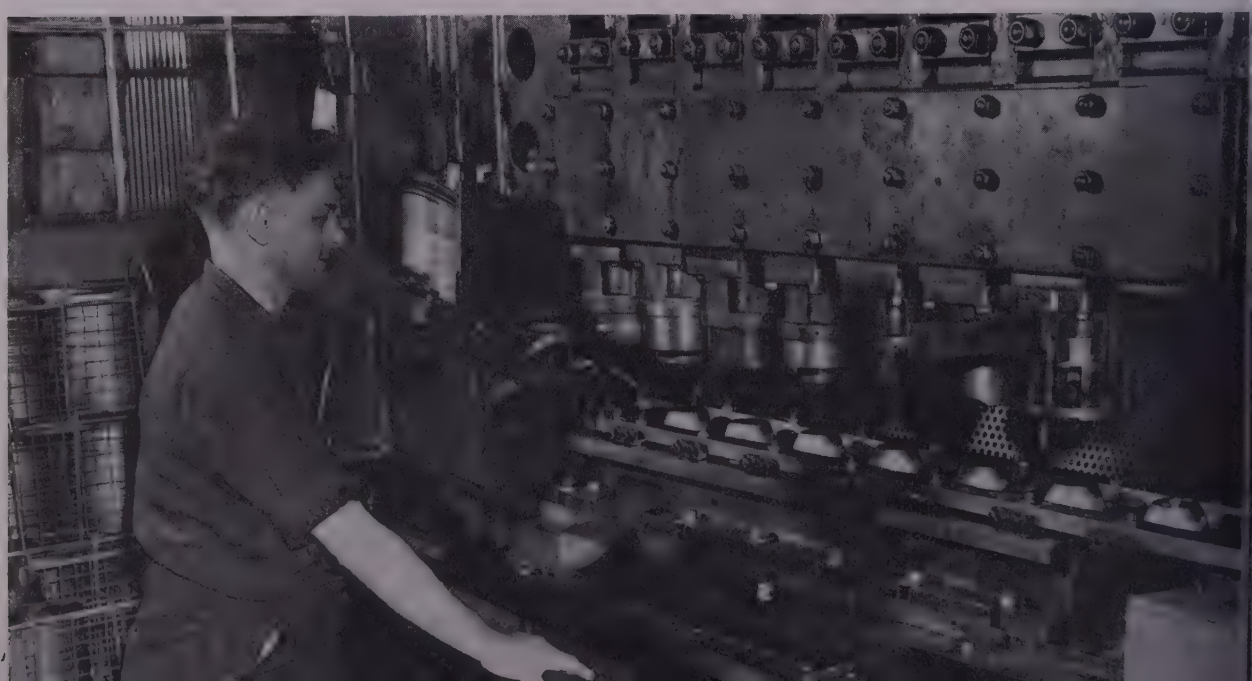
High output is maintained on press setups using progressive and single-cavity dies. A single press performs seven operations on about 7000 pieces in an 8-hour day

REAR (or license plate) and parking lamps may be classed as minor accessories of the modern car but their efficient production is just as important as that of scores of other components. Such production, for Ford cars, is assigned to the Flat Rock, Mich., plant of Ford Motor Co. parts and equipment manufacturing division and is carried out on a large scale with efficient tooling.

Blanks for rear lamp bodies and for parking lamp bodies are stamped out at a high rate in a 645 Bliss high speed blanker, Fig. 3. This is fed with 21-gage steel of 6-inch width from coils. Flash is cut up for scrap and drops into tote boxes while the blanks feed down a chute into another box.

Seven Dies—In the case of rear lamp bodies, the blanks are stacked for delivery to a 92½ H To press, Fig. 2, equipped with seven individual dies side by side. These constitute in effect a si progressive die. Transfer bars move the part f cavity to cavity until it is ejected after the seve operation. Blanks are fed automatically from magazine at one side and, except for watching setup to see that it functions as required, the erator need only keep the magazine supplied blanks.

Drawing is done in the first die and the flang trimmed in the second die, the flash being cut ejection back of the press. Third die straightens flange and stamps letters thereon. Operati classed as "curling" are done with dies operated



ms and springs at each of the next three stations, rtions of the flange being turned inward. In the al station, two holes are perforated, that at top nter being extruded upward. After this operation, e transfer bars lift the piece free of the last die and slides down a chute when the bars separate. This gle press thus performs seven operations on about 00 pieces per 8-hour day.

Tail lamp bodies are produced from blanks of the ape shown at the left of Fig. 1, which also shows e piece after five of the six remaining operations. e initial draw is made in a No. 247 Hamilton press, d is followed by a second draw in a No. 203 Bliss ess and a third draw in a duplicate press. A re- ike operation follows in a DG 54 Ferracute press, d then two side impressions are drawn in the No. 3 Bliss press. Finally, the flange is trimmed and ree holes are pierced through it besides three other les that are pierced, one in the center of each awn impression. This final operation is in another 54 Ferracute press. Production on this line of esses is about 675 pieces per hour.

Single-Impression Dies—These two stampings are od examples of two types of production. The first es, except for blanking, a set of dies (constituting, effect, a single progressive die) in a single large ss equipped with magazine feed and transfer bars. is press requires only one operator. In the other e of production, a group of much smaller presses. h with its own single-impression die and its own erator, does the same job, one step at a time.

Although the second type of production requires re labor and more presses, it is better adapted to tain types of work. Also, the presses can be set quickly for other jobs where a single large press h transfer arrangements, though convertible to er work, is less flexible, since the jobs to which it udapted are fewer in number.

Parking lamp doors are among parts produced in s plant from 21-gage brass which, besides being te resistant to corrosion and free from red rust- (such as may occur on steel) is easy to work, y on dies and is readily plated without the copper undercoating needed on steel parts that are subjected to severe exposure conditions.

Blanks for parking lamp doors of the shape here considered are drawn from blanks that are roughly elliptical and make one right and one left door. Drawing is done in a double-acting Bliss press, and pinch trimming and lug blanking are performed in a second die. Then in a third die, a window opening is cut in each half and the stamping is cut in two.

Placed in Cam Die—Next, each door is placed in a cam die. This die forms a flange around the window opening and also pierces two screw holes at odd angles. About 700 pieces per hour are handled through this die. Forming of each window is completed in horn dies, one right and one left, that form ears previously blanked. This makes the doors ready for buffing which is done in a straight line Robinson machine. This machine includes a series of carriers that, after loading, are traversed under a group of six wheels set at suitable angles to buff given areas.

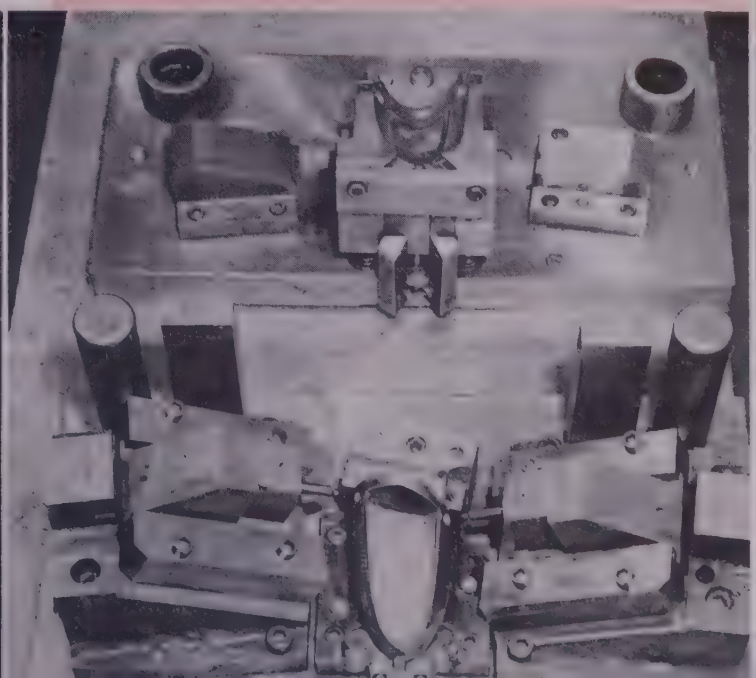
Near the center of this machine, the carriers are rocked automatically to a new position and then pass under another group of six wheels set to buff remaining areas on which bright plating is required. Carriers then return below the bed to the unloading and reloading station where the operator takes off buffed stampings and applies new ones to be buffed.

Upon leaving this machine, the doors go to a wheel where hand coloring is done. This readies doors for nickel and chrome plating.

Fig. 2 (left)—Toledo press equipped with a series of seven dies, a magazine for feeding blanks and transfer bars for automatic shifting of the rear lamp body stampings from station to station

Fig. 3 (center)—Blanks for rear lamp bodies and other stampings are produced rapidly in this high-speed Bliss press, using coiled strip stock. Flash, cut into two pieces, falls into a tote box

Fig. 4 (below)—Punch (top) and cam die in which the hole in a parking light door are pierced and a flange is formed around the window opening



Correctly Designed Jigs and Fixtures Can CUT WELDI

Each welding job has its own characteristics and its own problems. How effectively jigs and fixtures can facilitate production, increase accuracy and decrease costs on any welding application, depends upon the correctness of their design

MAXIMUM results are achieved from resistance welding when metal products are designed to take full advantage of welding possibilities. Similarly, the effectiveness of jigs and fixtures is almost wholly dependent upon their correct design, bearing constantly in mind that jigs and fixtures are employed to increase production accuracy and production volume—with cost-cutting as a principal objective.

Before a fixture or a jig can be designed for a job, the best possible method of welding the parts must be determined. An operation being done by repeated single spot welding may, by a simple change in the parts be performed by the projection welding method where all spots to be welded on the parts can be welded by one stroke of the machine, making for higher production and a much better looking finished article. By changing from the slow butt weld to the flash-butt weld, less finishing may be required, or a short seam weld on a difficult shape by the use of a mandrel and roller electrode may replace several spot welding operations, using a number of different shaped electrodes. It is always best to try various methods of welding the parts before a costly jig or fixture is designed and built. The machine available must be suitable for the stock to be welded in kilovolt-ampere capacity and welding pressure. The speed of the operation must also be considered.

Data Available — Welding data are available for thickness of stock or number of projections that can be welded by the various methods according to size and capacity of each machine. However, if the machine available is to be speeded up for a faster operation than that for which it was originally built, its kva rating must accordingly be increased, or the maintenance of the welder, due to the consequent overloading of the machine through replacement of parts and particularly the electrical portions thereof, will more than offset the supposed savings for faster operation through jigs or fixtures.

Correct use of such materials as tungsten-copper or its equivalent, the several grades of alloy copper, aluminum bronze, aluminum and aluminum alloys and nonmagnetic cast iron, also insulation materials in their different grades, and methods of insulating for protection from electrical current primarily, but a to resist flash particles thrown off the stock wh welding, water, dirt, and handling protection can be fully described here. These data are available a the designer should be familiar with these materi and use them in their proper places.

Aluminum bronze, or its equivalent, is used fixture bases, arms, clamping devices, stops and su parts of a jig or fixture close to or part of an el trical conductor where greater strength or wear necessary than could be obtained if brass or cop or other nonferrous, nonmagnetic materials w used. Aluminum and its alloys can be used ext sively in jigs where a minimum of weight is necessa However, aluminum should not be used for actual c rent-carrying parts because oxidation will deve eventually and sometimes cause serious trouble.

Nonmagnetic Cast Iron—Nonmagnetic cast iron used frequently for parts of a jig or fixture close or in the magnetic field of the welder. It is chea than aluminum or bronze and slightly stronger th ordinary cast iron. Fixture bases, frames and m chine arms are frequently made of this mater sometimes known as "nickel iron."

Copper is mentioned last because it is most f quently used as a basis for welding jigs and fixtur It occupies as important a place for welding mach jigs and fixtures as iron and steel do for other m chine tool operations. Rolled copper in flats a rounds, cast copper and hammered or forged cop are indispensable. Copper, stainless or high-streng annealed steel tubing cast into copper castings sho be used wherever possible for water cooling inasmu as drilled holes in copper castings usually per leakage of water that is very difficult to stop.

Frequently, it is necessary to alter the welding m chine in some way to adapt a jig or fixture for method of welding desired. Motor-driven, air- or draulically-operated press type welders can rea be changed to do projection or spot welding by sim altering the electrodes. It is essential that all p jection welding electrodes be located directly sturdy construction to avoid deflection.

Fundamentals Considered—In designing the jig

OSTS

:ture best suited for an individual job, the designer ust keep certain fundamentals before him. At the tset, all magnetic materials must be kept out of the op which, in a spot welder, is the gap surrounded the upper and lower arm, the electrodes and the se of the machine housing the transformer. This p is an intense magnetic field and any iron or eel placed in it will become hot and in some cases tually melt. Furthermore, the presence of iron or eel in the "loop" chokes the available welding cur- nt making for poor efficiency of the welder.

In the matter of welding electrodes, the designer ould make them easily and quickly replaceable and ater cool them as close to the tip as possible. The let water tube should not be less than 3/16 to 3/8- ch ID, depending on the job.

Incidentally, it is surprising how often the matter proper water cooling is neglected—an oversight nich makes itself known through overheating, ex- ssive wear, transformer burnouts and the like. On high production job where electrodes are welding ith each stroke of the machine, running continuous- , an individual and separate water-cooling line ould be provided for each electrode. Provision ould be made for a sight drain pot and it should be spected frequently to insure a flow of cool water. egulation valves should be provided to adjust this ater flow to prevent waste.

Welding under water has been found a decided ad- ntage in seam or line welding of small diameters here sufficient water cooling could not be provided the lower arm because of work clearance. In the al feeds for projection welding, this method has mplified the water circuits considerably.

Electrode Wear—The designer must also make the cessary provisions for electrode wear. Not only ust adjustment of electrodes be provided to main- in a constant welding pressure on the work at all mes, but stops, gage points, pins, etc., must also com- nsate or be of a large enough surface to gage the ork at both the new and worn-out electrode height.

Another design caution to be observed is the pro- sion of sufficient cross-section to current-carrying embers, run as close to the electrodes as possible d with as few breaks or connections in the circuit possible. A welding current, of course, is extreme- high in ampere capacity and carries from 3 to 20 v, pending on the machine and on the job—and a pure pper conductor can carry only a limited current de- nding on its mater and cross-section. For pur- ses of estimating cross-sections the following cur-

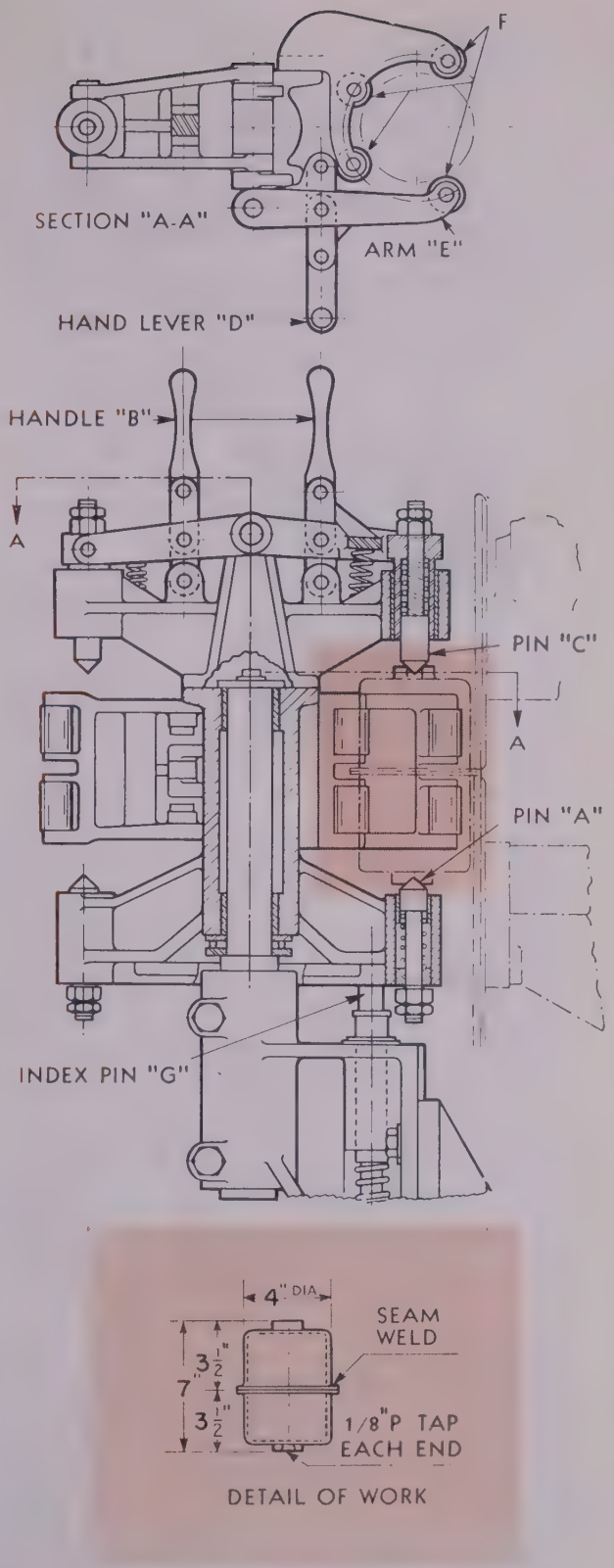


Fig. 1—Two-station seam welding fixture for welding two halves of a container. Key is explained in text

rent densities, based upon a 50 per cent duty cycle, are recommended:

(a) Rolled copper sections should carry up to 1800 amp per sq in.
(b) Cast copper sections should carry up to 1500 amp per sq in.
(c) Water cooling either of the above will increase its capacity approximately 100 per cent.
(d) Low-duty cycle will allow more current to be carried per square inch of conductor than a high duty cycle.
(e) Other nonferrous alloys can be used provided the section is large enough. Where breaks or connections must be made, the clamping surface must be at least twice the cross-section and the surfaces scraped smooth and parallel, and bolted solidly together.

This is particularly necessary on flash welders although on spot or projection welding some flashing is bound to occur and when as many as 2000 to 4000 welds are made per hour, flashing can cause considerable trouble by getting across insulated pins, causing a direct electrical short, or into slides, making repairs necessary.

Since the welding pressure application to a piece of work has a direct effect on the weld, the design of a fixture must take into consideration the following: (a) Accuracy in the machine work for projection welding fixtures and electrodes, and (b) elimination of deflection due to welding pressure, so that upper and lower electrodes are parallel to each other in all planes and remain so when final welding pressure is applied. When necessary to projection weld at a slight angle the projection should be elongated in the direction of the possible "slide" that occurs when "squeezing" for the weld. Flash welding clamps must be so designed as to clamp the piece of work with at least twice the final pushup pressure to prevent possible slippage of work and to insure a good electrical contact. Welding height or point where the electrode touches the work in "rocker arm" machines should be in a direct horizontal line to the fulcrum point of the arm, so that no slipping or wiping of the electrodes on the work will result when pressure is applied.

Ease of Loading—As is true of all jigs and fixtures for any machine, ease in loading and unloading must be taken into consideration during the design stage. One feature of a welding fixture that is not common to fixtures for other machines is that a welding fixture must be designed and built to accommodate the loading of usually two or more separate parts that become, after the welding operation, only one piece that must be unloaded. Care must be taken that a welding fixture or jig will unload properly when the parts are welded. Danger to the operator when loading and unloading fixtures and jigs, from the standpoint of electrical shock, is very remote provided there is no primary short in the machine.

Secondary current, or welding current, is of very

low voltage and is entirely safe even though t secondary circuit is unprotected. However, for t operator's protection, only one side of the seconda circuit—either above the top electrode arm or bel the fixture base—should be insulated from the ba of the machine. The welding machine should also grounded so that, if a primary short develops in t transformer or controls, it will be positively ground through the welding machine and not through the o erator, as would be the case if both sides of the s ondary circuit were insulated from the machine ba and the operator were touching both upper and low electrodes or electrode supports. Further protecti for the operator's hands should be taken into cons eration by providing guards on hand-loaded electro dies. Use of two hand-operated control switches th must be pressed by the operator's two hands usua is a simple method of assuring absolute safety.

In a welding fixture or jig for heavy welding wh the stock may not always be clean, there is a te dency for the work to stick to the electrode fac This should be taken into consideration where p gressive jigs are used, also when automatic or qui loading and unloading of the work is desired. Knoc out pins, operated through a leverage advantage by an air cylinder, or a positive stripper save co siderable production time and add to the operato protection.

Magnetic pull of a welding machine toward t transformer is frequently of such intensity as to l small pieces of work out of their locators, and sm eccentric clamps made of steel, when sufficiently cl to the loop to be affected, are sometimes actually

Data and illustrations from Resistance Welding Institute, Cleveland.

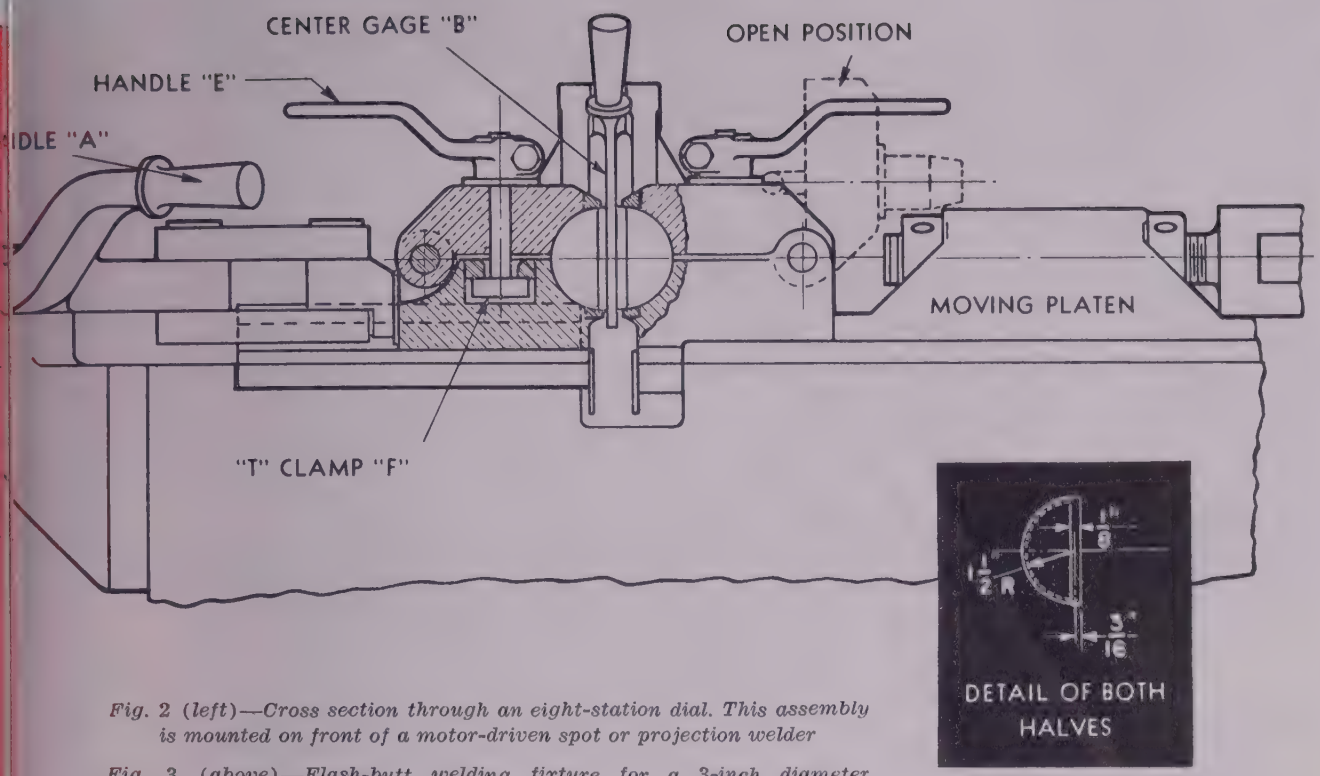


Fig. 2 (left)—Cross section through an eight-station dial. This assembly is mounted on front of a motor-driven spot or projection welder

Fig. 3 (above)—Flash-butt welding fixture for a 3-inch diameter spherical shell

used by this force. Workholding plates and clamp handles of nonmagnetic material will prevent this condition.

Fig. 1 illustrates a two-station seam welding fixture for welding two halves of a container as shown in detail of the work. Lower half is loaded on pin A and upper half directly on top, with flanges together. Handle B is then raised and top pin C holds top half in place. Locating pins are spring mounted. Hand lever D then closes roller arm E to a definite stop and rollers F maintain concentricity of the two halves during the welding operation. Welding rolls and portions of the welding machine are shown in dotted lines. Entire fixture is mounted on a slide and with the adjusting screw can be raised or lowered to compensate for roller wear.

The two stations are rotated by hand and through foot-operated index pin G, are located in a welding position. This foot treadle is also arranged so that it automatically starts the welding sequence when the index pin locates the station, the welding sequence being the lowering of the upper welding roll which is driven and which in turn revolves the work, completing the seam weld. The operator, then ready for indexing to opposite station, presses the foot treadle which breaks welding circuit and raises the upper roll. This fixture is for mounting on a standard circular seam welder.

A flash-butt welding fixture for a 3-inch diameter spherical shell is shown in Fig. 3. Detail of each half is shown. The usual standard hand-operated flash welder is used and the fixture consists of a left-hand die mounted on the usual stationary platen, a center gage for alignment of the two halves and moving platen die. Both dies are split and hinged completely open for loading and unloading.

After placing the two halves of the work in the dies, dies are swung shut but are not locked. Handle A then moves left hand die against center gage B, (straightening the toggle links) squaring up the work. Handle E is then turned 90 degrees and this half is locked through a T-clamp F. Moving platen is then moved against center gage B; when work in this die is squared up it is clamped.

Center gage is then raised and the two halves butt-welded together. Dies are then opened and work removed. In flash-butt or upset-butt welding the clamp assembly used incorporates the special fixture requirements. Flat, round or irregular shaped work can thus be located and clamped with clamp assemblies especially designed for this particular work.

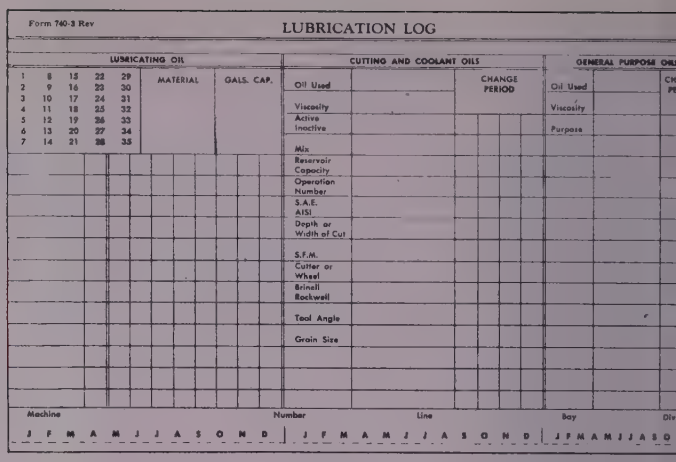
In Fig. 2 is illustrated a cross-section through an eight-station dial. This assembly is mounted on the front of a motor-driven spot or projection welder, and is driven by a shaft extension from the welder clutch box, through a roller chain drive to sprocket A, then through bevel gears B and Geneva drive C. Main spindle D is copper; commercial alloy copper is used for bushings and contact plates E. One contact plate is fastened to the revolving spindle and one to the lower support casting F, also made of copper, by flat head screws.

The lower electrodes or dies G are simple in construction, and wear space is provided. Water connection stuffing box H provides for water cooling through inlet I, through center tube, around inside of the dial and returns through outlet J. Bevel gears and Geneva drive are enclosed and run in oil.

LUBRICATION SERVICE SYSTEM

. . . pays off in less machine down time

Based successfully on the idea that lubrication failures can be eliminated if machines are lubricated with the correct lubricant, applied in proper quantity at the right time and in the right way, Tapco's established lubrication department could well serve as a pattern for other metalworking plants


Form 740-3 Rev

LUBRICATION LOG

LUBRICATING OIL

					MATERIAL	GALS. CAP.
1	8	15	22	29		
2	9	16	23	30		
3	10	17	24	31		
4	11	18	25	32		
5	12	19	26	33		
6	13	20	27	34		
7	14	21	28	35		

CUTTING AND COOLANT OILS — CHANGE PERIOD

Oil Used
Viscosity
Active
Inactive
Mix
Reservoir Capacity
Operation Number
S.A.E. AISI
Depth or Width of Cut
S.F.M.
Cutter or Wheel
Brinell Rockwell
Tool Angle
Grain Size

GENERAL PURPOSE OIL

Oil Used
Viscosity
Purpose

Machine Number Line Bay

J F M A M J J A S O N D | J F M A M J J A S O N D | J F M A M J J A S O

By O. M. ALBL
Lubrication Engineer
Thompson Products Inc.
Cleveland

CORRECT lubricants are an integral part of any machine. No machine is complete unless lubricants are correctly applied in the proper places, in the required amounts and at the right time. On these premises, Thompson Products Inc., Cleveland, established its planned lubrication service. As a result of efficient functioning of the lubrication department, down time chargeable to this department is under 0.5 per cent on productive hours for over 7 years.

When the present lubrication department was founded, (STEEL, Aug. 9, 1943, p. 82) a lubrication engineer was appointed. He is also foreman of the group, responsible for the selection of oils, greases, recommendations, system, procedures and management of supervisors and lubrication service men. The foreman is subordinate to a general foreman who is also in charge of the machine repair department. This arrangement eliminates most of the "buck passing" between these departments since they both have the same department head.

A survey was taken to determine what oils were being used in each machine and/or equipment. It was found that at least 40 per cent of the oils in use could be and were eliminated. Samples of the remaining oils were sent to the laboratory for their inspection and approval. Then the official recommendations, for the time being, were made for each machine, with due consideration being given to the major oil suppilers' survey, machine manufacturer's recommendation, and our own past experience.

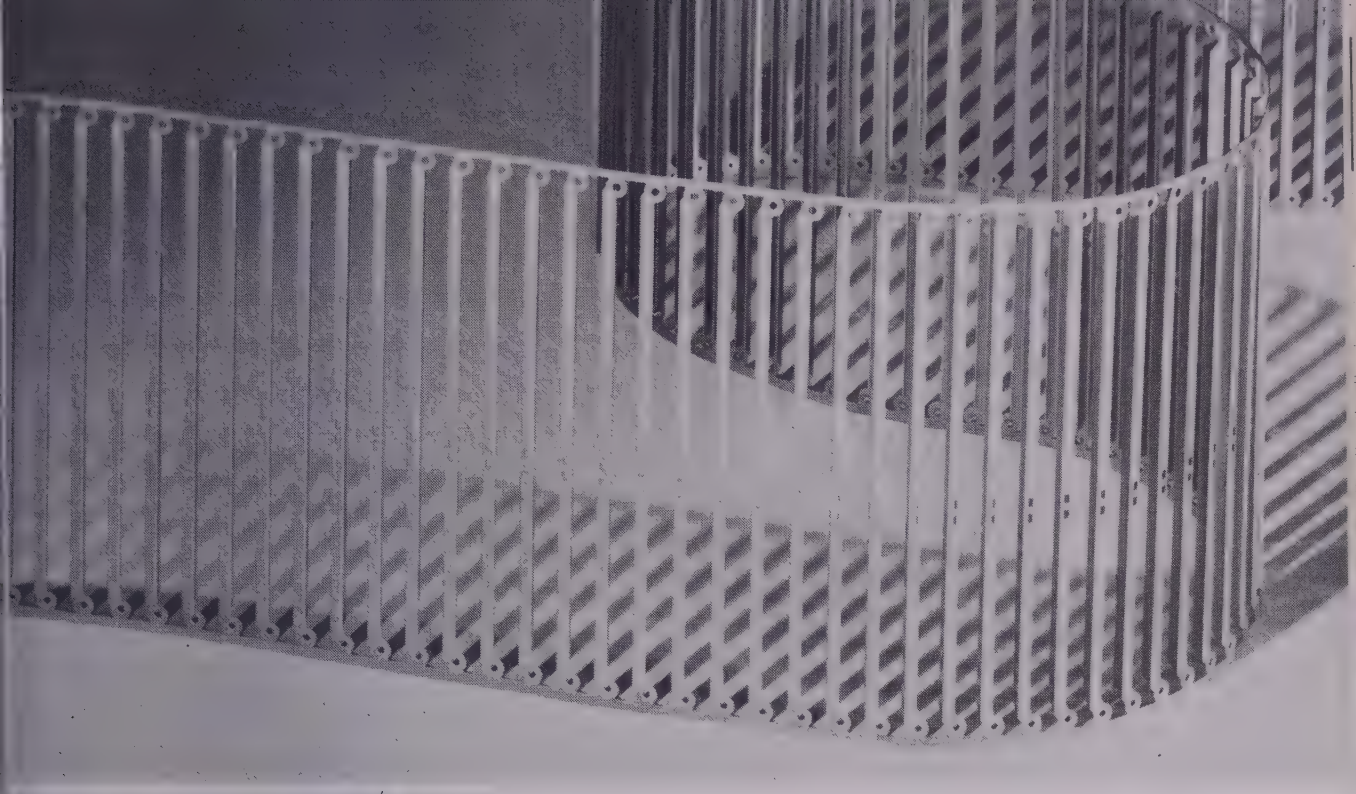
Changeover Complications—Considerable time was spent in making all the necessary changes that had to be made in order to conform to the recommendations, so each machine had the specified lubricant in all its various parts. Then began the long, tedious job of checking the recommendations. Samples of oils in actual use were taken at specified intervals, the amount of make-up oil that had to be added, and at what frequency it had to be added, was recorded. Temperature readings were taken at intervals, and finally the major supplier made a complete, before-and-after report of specifications, which were submitted to the chemical laboratory. The results were checked here.

This work continued for a period of from 6 to 9 months. Since machines were operating on a three-shift basis, it meant that testing covered a period from 18 to 27 months. Results of all this testing proved that the correct lubricants had been selected and were applied in the right places. This made it possible to set up a definite frequency for each category of lubrication. In setting up frequency changes, we made an allowance for a safety factor which proved, and is proving beneficial, since machines in most cases have been speeded up.

At intervals, further surveys were made by other suppliers and the same testing procedure followed. The result was that all but a few oils passed these tests with varying degrees of success. In testing lubricants, the following factors were taken into consideration: (1) Lubricants must perform satisfactorily in the service for which they are inte ed, with a minimum of friction wear. (2) Quality and performa characteristics of each lubricant w evaluated and the oils selected to k lubrication labor costs at a minim and to insure minimum interfere with production. (3) Lubricating for circulation or splash systems m be capable of being reclaimed with loss of service value.

Titles Changed—The names, "oil department" and "oilers" are not u at Tapco. Instead we have a "lu cation department" and "lubricat service men." We believe this po should be adopted more universa This change in titles has resulted attracting a higher type individual the department, thereby making possible to raise our standards. cabinets, supervisors' desks, and p titions of the main lubrication stat are painted white. This feature a had its effect, resulting in neater more efficient work. Each man assigned a drawer at the main s tion where he can keep his perso tools. He is provided with a gre gun, oil cans, tallow pots, etc. policy has reduced the replacem costs considerably. Records sh that one man used the same oil and grease gun for over 5 years keeping them repaired at all tim When the same equipment was u by all three shifts no one was p ticularly interested in keeping it first-class condition. Good tools equipment have further raised lu cation standards.

Total number of machines equipment is divided into equal tions and a lubrication service ma



14½% more units per die grind

urate material. By actual count, THINSTEEL elded" 6000 more parts per ton.

t THINSTEEL'S close gauge accuracy esn't stop at cutting material costs. It also rs off in lower tool costs. To quote again m our customer's letter:

The figures show us that we got 14½% nore units per grind from the same quantity nd same shipment of steel as we listed in he above instance as against the same ship- nent from another mill."

addition, machine shutdowns for coil replace- nt were reduced in number because CMP INSTEEL comes in extra-long coils.

hatever grade or size of flat-rolled steel you using, THINSTEEL offers equal oppor- ities for cost reduction. A CMP representa- ve will gladly call to help you figure just how ch you can save.

me on request.

COST SAVING ADVANTAGES OF THINSTEEL

Wide Range of Tempers and Analyses in Carbon, Alloy and Stainless Grades.	The analysis and physical properties best-suited to your fabricating processes and to the application requirements.
Close Gauge Tolerances.	More parts per ton. An average oversize gauge variation of .002" on .030" strip means 6⅔% fewer parts per ton. Less strain and wear on dies.
Extra-Long Coils.	Fewer machine shutdowns for coil replacement. Fractional-inch widths can be oscillated-wound in coils containing several times the footage of ordinary coils.
Gauges Thin as .001".	Lighter gauges with properly-developed physical properties can be used to replace heavier material, reducing weight without sacrificing strength or utility, cutting shipping costs all around.
Any finish — dull to mirror-bright or electro zinc coated.	Your choice of regular cold-rolled for ordinary applications, mirror-bright for plating, or mirror-bright stainless or electro zinc coated for corrosion resistance.

Cold Metal Products co.
YOUNGSTOWN 1, OHIO

LOUIS • INDIANAPOLIS • LOS ANGELES

assigned to each one and is held responsible for all the routine work within his area. All routine work is set up on a definite frequency and consists of hand oiling, filling spindle cups, oiling motors, general greasing, etc. Men are changed from one area to another periodically in order to train them as first class lubrication men and for supervisory positions.

Frequent Checks—If a machine is not running it is not lubricated. However, if it is down for more than 8 hours the rule is that it is not to be started until it is checked over for lubrication. The supervisor of production groups is responsible if the lubrication department has not been notified. Over the weekend when some machines are not running, a crew fills spindle cups and reservoirs. The men start up the machine 2 hours before the first shift begins on Monday morning. This procedure is followed so the operator can produce high precision work at the beginning of the shift without waiting for his machine to "warm up." The routine frequency is changed when and if a change is made from a 5-day week to a 6 or 7-day work week or vice versa.

Scheduled work pertains to those categories of lubrication which are set up at frequencies of 3 months or longer and consist of jobs such as greasing electric motors, changing the oil in gear cases, spindle reservoirs, etc. Oil in hydraulic and lubrication systems is set up to be filtered every 3 months. However, the oil is not filtered arbitrarily. If it is in good condition the filtration date is set up for another 3 months and so on until the oil needs filtering. Oil is filtered over and over again until such time as it becomes necessary for it to be changed. The change period is determined to a degree upon the neutralization number, but mostly upon other determining factors. The filters used are the portable type which permit the oil to be filtered while the machine is in operation.

One of the major expense items connected with lubricating machinery is walking time or transportation. Scheduled lubrication was set up so that not more than four trips to a machine are necessary during a year. Previous to this time more than ten trips were made. In order to accomplish this reduction in walking time, more categories of lubrication are serviced per trip and the best oils and greases are selected to extend the periods to conform to the schedule wherever necessary. Scheduled work is further confined to certain sections or divisions of the plant each month so the work is not scattered over a great area.

CATEGORIES OF LUBRICATION

1. Hand Oiled Parts
2. Spindle
3. Lub. or Central Reservoir
4. Hydraulic Reservoir
5. Ways or Ways Reservoir
6. Knee Reservoir
7. Headstock or Work Head
8. Tractor Wheel
9. Air Line Lubricator
10. Bijur Pump
11. Tail Stock or Chuck
12. Gear Box
13. Turret-Apron or Head
14. Worm Gear and Head
15. Transmission
16. Motor Gear Head
17. Motor Bearings (Oil)
18. Chain or Chain Drive
19. Motor Bearings (Grease)
20. General Grease
21. All Pump Bearings
22. Fan Bearings
23. Gear Drive
24. Open Gears
25. Couplings
26. Fly Wheel Bearings
27. Solenoid Reservoir
28. Trueing Device
29. Cables
30. Screw
31. Speed Range Unit
32. Automatic Lubricator
33. Filter
34. Clutch

Transportation Costs Cut—To cut transportation costs still further, sub oil stations are situated throughout the plant so that walking time to and from the station and the machines is cut to a minimum. Sixty-five gallon lubsters are used at these stations for small volume needs. For large volume, drums are set up on four-wheeled racks which enable them to be pushed from one machine to another. Oil in the lubsters and drums is checked daily by the supervisor and the necessary supply ordered.

Men doing routine work are furnished with four-wheeled carts which hold four 5-gallon cans. The carts have a compartment on the back large enough to accommodate a hand grease gun, buckets, oil cans and one grease gun filler bucket. These carts help to reduce still further transportation cost. Several years ago the regular engine oil used for hand oiling was replaced by a higher quality oil that costs more, but which made it possible to reduce the frequency of hand oiling by 66 per cent. The cost of the oil was reduced since only one-third as much was used and the machine life was increased because a better lubricant was applied. All these improvements in transportation resulted in reducing the working crew by approximately 55 per cent.

In order that the cost of lubrication service can be charged correctly to the various groups, a time study was taken of all operations. Servicing time for each category of lubrication was recorded together with walking time, delayed action, personal time, etc., taking into consideration several hundred machines and equipment. Number of grease fittings on each machine type were counted, etc. There are well over 700 various ty of machines, so the task was not ea This information was typed up i report which lists the machines each group with time allowances each type of lubrication that is fo on a machine. It also summari the information so that we know lubrication labor cost per mach group division or the complete pla

Cost of lubricants used by any i vidual machine can be ascertained recording the amount of all grease oil added at intervals, plus the o inal fill on a record form hung on machine. When a new machine is into operation, or production creases by starting up an idle exist machine, the service time is ad and vice versa. The time study shows how many lubrication ser men are needed, and it helps to vide the sections equally since production is such that a man n have fifty to seventy different ty of machines and/or equipment in section.

Identification Systems—Many s tems have been used in the past identify the oil with the part of machines so that the application the correct lubricant would be sured. A simple system was fin adopted that calls for applying small red disk, with a silver le imprinted on its face symbolizin certain oil or grease, on the inside the filler caps, spindle cup, snap etc. Inside of cap was chosen protection against the painting, s ing, or removal of the codes.

The lubrication service man rep all oil leaks to the supervisor of group whose responsibility it is to quest a maintenance work order that the leak is repaired by the p er maintenance group. If a mac starts using more than the nor amount of oil, the supervisor is vised to call the machine repair partment to remedy this condit Likewise, if the lubrication or draulic oil is being contaminated coolant or cutting oil, a reques made to supply the necessary gu or repair the leak. Many gallon oil have been saved by this proced Schedules are also better maintai since it takes a great many unne sary trips by the lubrication ser men to keep a leaking reservoir fi

The standardization and simpli tion program continually being ried on has further helped to crease efficiency. The program for simplification of methods, o tions, filing systems, records, Standardization of oils, greases, terials, grease fittings, motor

(*Please turn to Page* 86)

Spotlight's on "Specials" BY LAMSON!

UPSETTING + MACHINING + LAMSON "KNOW HOW" = DEPENDABLE PRECISION PARTS

Of course you think of Lamson for headed fasteners.

But did you know that Lamson produces precision Screw Machine Products for many of the country's best known, "blue ribbon" manufacturers?

Within this one organization are modern facilities for hot and cold heading, machining, grinding, broaching, bending, flattening, punching, drilling, heat-treating and plating.

Add to these facilities Lamson's unsurpassed "know how" and you'll understand why it's wise to check with Lamson *first* for small parts production . . . Screw Machine, Upset or a combination.

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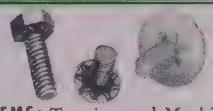
"One Dependable Source for All Fastener Needs"

SEMS	LOCK NUTS	NUTS	STUDS
STOVE BOLTS	LAG BOLTS	WASHERS	RIVETS
APING SCREWS	ROPE CLIPS	SET SCREWS	PLOW BOLTS
"CAP SCREWS	MACHINE BOLTS	CARRIAGE BOLTS	COTTER PINS

CUT ALONG THIS LINE

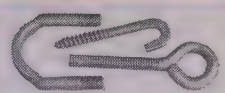
CHECK—and CLIP this strip.

LAMSON LOCK NUTS: Economical, vibration-proof. Can be re-used repeatedly.

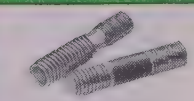


SEMS: Tapping and Machine Screws with Lockwashers attached.

COTTER PINS: Steel, Brass, Aluminum and Stainless Steel



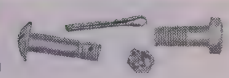
"BENT" BOLTS: Including U Bolts, Eye Bolts, Hook Bolts, etc.



LOK-THREAD STUDS: Thread locks and seals in standard tapped holes.

Wire Rope Clips: Hi-Center saddles, extra-strength U Bolts.

PLASTIC INSERTS: To your specifications . . . in production quantities.



AIRCRAFT FASTENERS: AN Bolts, Nuts, Screws, Studs and Cotters.

"1035" CAP SCREWS: Hi-Tensile heat-treated steel.

The Lamson & Sessions Company
1971 W. 85th St., Cleveland 2, Ohio

NAME

POSITION

COMPANY

STREET

CITY ZONE STATE

UNIFORMITY
In Finished Work

. . . promoted by special machine designed to perform four operations on bicycle pedal crank

FOUR machining operations on a bicycle pedal crank are performed at reduced production costs and with uniformity in finished work, on a special semiautomatic production machine. Three drilling and two tapping units manufactured by Black Drill Co., Cleveland, are employed on the machine. These units are operated by air, with a hydraulic check for feed control, and built with a patented traversing rotor.

By eliminating the customary splined shaft and using heavy duty motor bearings, torque is applied evenly around the solid motor shaft so that end play is reduced practically to zero. The rotor actually shifts in and out of the magnetic field; provision is made in the motor windings to compensate for loss of torque and to dissipate heat.

A special ¾-hp unit with a 6-inch stroke, operating at 1150 rpm, performs a ⅜-inch diameter hollow milling operation on the driving lug of the sprocket. This unit was required to have a long stroke in order to clear the frame of the machine at that point. It has 4 inches of nonrotating travel and 2 inches of working travel. A standard length stator is used which means that the rotor leaves the magnetic field completely on the return stroke; the unit has a built-in limit switch that automatically turns the motor on and off as the rotor enters and leaves the magnetic field. This is entirely feasible as the motor gets up to full speed within 1½ turns of the rotor.

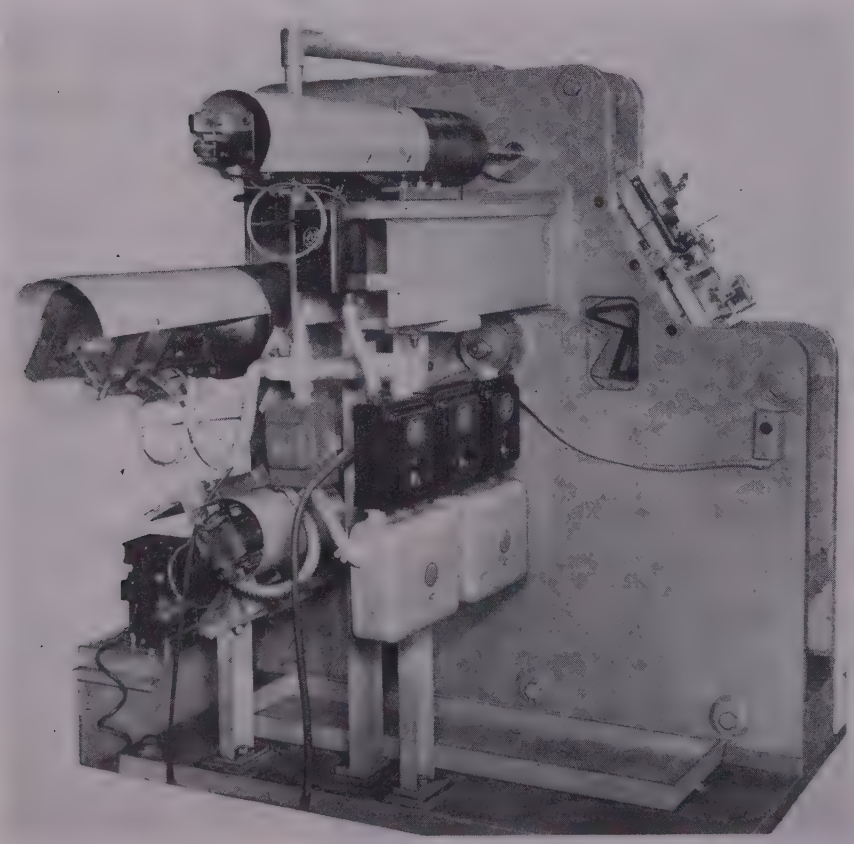
Two standard units, ¾-hp operate at 840 rpm for a combination eration consisting of a 7/16-inch drill size and a ¾-inch diameter facing of the bicycle pedal h The spot facing is held to close li through the depth adjustment co on the unit which is capable of h ing the tolerance within 0.001- of required size.

Last operation consists of tap the two pedal holes ½-inch-20, right-hand and one left-hand thr with two opposed tapping u These are standard tapping u 540 rpm, built by Black Drill The same traversing type roto used with controlled air feed, self-contained reversal through small double-acting air cyli mounted on top of and opera from the same air supply as main air cylinder.

This small air cylinder carrie limit switch operating through magnetic reversing starter that verses the motor at the required ping depth. Because of the ins reversal and positive depth con it is possible to tap even blind h without danger of tap breakage.

All five units on this machine erate electrically through solen and limit switches that will not mit any of the units to advance the machine has indexed exactly the proper location, and will not low the machine to index until units are completely back in the turn position.

Specially-designed semiautomatic machine which performs four machining operations on bicycle pedal crank. Courtesy Barth Stamping & Machine Co., Cleveland



Brushing Results in Savings

USE of a new power brus process smoothes out polis marks and brightens and prep the surface of stainless steel vision bars for automobile dows for final color bufing. P ess has enabled a large prod of automotive parts to increase duction to over 6000 per day; in dition, considerable monetary sav have resulted. Equipment used 14-head in-line polisher, in which divider bar is placed in a holder m ing on a continuous chain thro the polishing line.

Power brush sections used in process are made by Osborn Mfg. Cleveland. The first four heads Monarch tampico brushes used abrasive. The last three stations buffs run at 4000 rpm with spra abrasive. At this point the div bar is finished on one side; it is automatically rolled over and m under a second set of seven head polish the other side.

At the end of the line, the bars removed and placed on a conv rack which carries them throug Solventol bath. They are then d and masked to prevent injury.

elding Process Extended to
TAINLESS STEEL APPLICATIONS

CCESSFUL application of inert -shielded metallic arc welding cess to chrome nickel or stainless els and aluminum bronzes has ne about since the original an- ncement of its use in welding of minum up to 2 inches or more in kness (see STEEL, November 29, 8, page 86). The process, devel- d by Air Reduction Sales Co., w York, involves continuous feed- of a coiled wire electrode in a eous shield through the barrel of welding gun. High speed continu- deposition of filler metal is pos- e in all positions with a complete- visible arc. Both manual and au- atic equipment are available.

When applied to the welding of inless, the process has the advan- e of having the filler metal car- l across the arc and deposited in weld almost without loss of al- ng elements. Use of titanium-sta- zed filler metal is possible because process transfers virtually 60 per t of the titanium that may be sent across the arc.

lore stainless steel is deposited at given value of welding current, minimizing heat effects in the base metal. The weld surface is dull, but it grinds, buffs, and polishes to any desired finish. Welds are said to be sound, without porosity or slag inclusion.

Bottleneck Broken—An illustration of the speed of application is given by J. S. Thorn Co., Philadelphia, manufacturers of welded aluminum window sash and frames. It was found that the welding of ¼-inch hinges to ⅛-inch aluminum frames was taking too long, but the installation of Aircomatic welding broke the bottleneck, cutting the welding time appreciably from 1½ minutes per frame. Individual welds with the new process were made in as little time as 5 seconds, these welds measuring ¼ x 1½ inches. Helium was the shielding gas used and 200 amp dc reversed polarity current was used. Type 43S 1/16-inch drawn aluminum wire was fed through the welding gun at the rate of 175 inches per minute.

When using 1/16-inch wire it is possible to deposit 15 pounds per arc hour when welding in the downhand position. Additional time is gained by no time out to change electrodes.

Heavy plate joint designs can be modified to have only a small included angle, resulting in large savings in welding material and time. The included angle may be reduced to 30 degrees as only the fine 1/16-inch diameter wire must reach to the bottom of the weld groove. Diameters of wire available are 0.035, 0.045 and 1/16-inch in AISI types 310, 316 and 347.

Formerly requiring 3 hours to weld a 4 x 5-foot aluminum tank side section, Martin-Quaid Co., Philadelphia, cut the time to 15 minutes with the use of the Aircomatic process. Using 1/16-inch drawn aluminum wire and 208 amp dc, wire feed speeds of up to 208 minutes were obtained.

Strain-Gage Research Extended

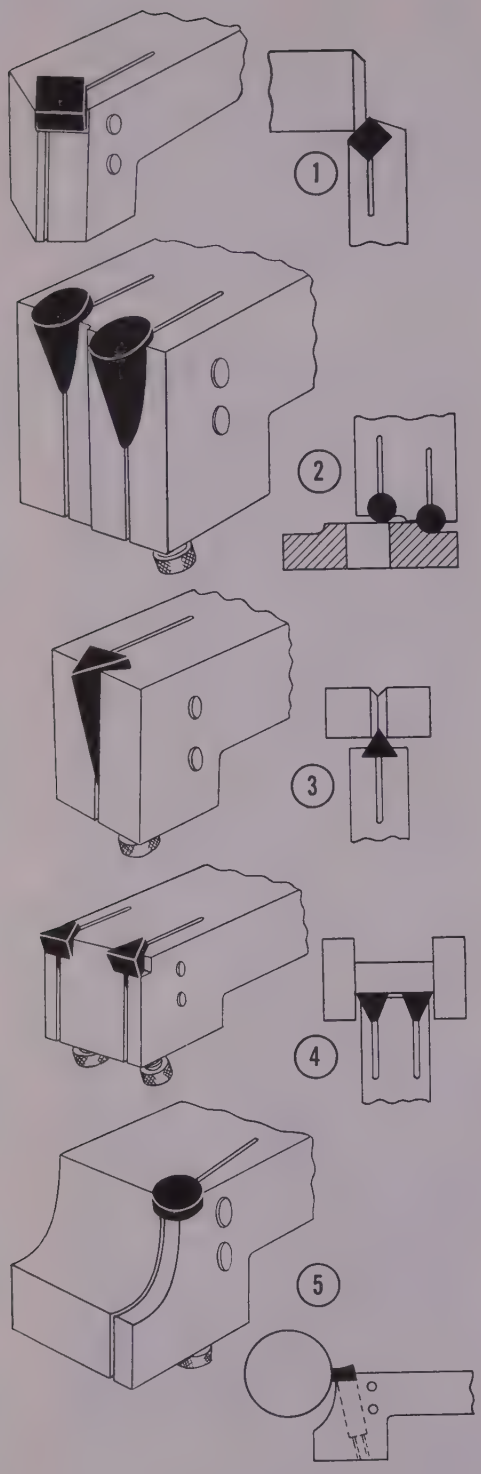
INSTANTANEOUS determination of loads on the plug and bar while seamless steel tubing was being rolled in the high-mill have been obtained from new dynamic strain-gaging equipment in the research laboratory of National Tube Co., Pittsburgh. In another research project exact figures were obtained on strains and stresses set up in a drill-pipe joint while the joint was being assembled, and later, while the joint was tested by bending. Residual stresses in pipe and a wide range of other stress-strain problems are now under study.

Available for use in the laboratory or in mills when desired are two 6-channel electrical resistance strain-gage units which employ a 2000-cycle carrier wave, with individual amplifiers and strain indicators, together with two recording galvanometer-type oscillographs capable of operation up to 500 cycles per second. It is capable of determining temperature drops at rates up to 2800° F per second. This latter equipment is being used to study quenching rates, readings from thermocouples attached to the specimen being recorded on the oscillograph.

A standard static-reading indicator has been provided which is capable of indicating results from SR-4 strain gages in terms of five millionths of an inch. A Fairchild oscillo-camera may be mounted on either of the standard oscilloscopes, making them available for use as recording cathode-ray oscillographs. Use of this equipment may be in determining peak strains under impact conditions or in studying hydraulic surges. In the camera unit, the film speed may be varied between 1 inch per minute and 60 inches per second.

German Welding Journal

GAS and electrical welding and cutting and surface treatment are within the scope of a new journal, Schweissen and Schneiden, published in Hanover, Germany. Published monthly by Friedrich Vieweg & Sohn, Braunschweig, it is sponsored by the Germany Welding Society.



Examples of carbide insert tool designs for special purposes, embodying the principles noted in text. Holders here were developed by Carboloy Co. Inc., Detroit

DESIGN CONSIDERATIONS

Of Special Carbide Insert Holders

MOST common use of special carbide insert tool holders is where it is desired to incorporate some special angles, use two inserts rather than one, etc. Regular production machining jobs, for the most part, can be performed with the standard holders using standard inserts. Holders of a special nature also use the standard solid carbide inserts.

As an example of a special application, Fig. 1 shows a special tool holder made up for chamfering which uses a square insert, positioned at 45 degrees in the holder. Fig. 2 shows a holder for step turning or where it is desirable that one insert act as a roughing tool and the other as a finishing tool. In designing holders with two inserts, care must be exercised in locating the clamping screws as it may be necessary to have separate screws for each individual insert, there being the possibility that one insert will be clamped tightly and the other remain loose. Figs. 3, 4 and 5 show other special holders.

Special holders should be carefully laid out to make sure that there will be enough steel around the insert to give good clamping and ample strength. Another factor should also be considered: If space limitations make it necessary to substantially weaken a holder it may prove more economical to use conventional brazed tools.

Inserts Cannot be Changed — On some automatic machines, tools on the back are fed in on an arc, causing the effective rake and relief angles on the insert tools to vary with the diameter of the work. These cutting angles may be changed readily by grinding to suit the application with brazed tools, but on insert tools relief angles are predetermined by the holder and cannot be changed. Consequently it is often better to use brazed tools on such applications unless the length of run will justify a special holder.

Machining of soft steel, aluminum and certain nonmetallics where neutral or positive rakes are required often presents another cutting angle problem. Except for round inserts, which can be ground with a concave top surface to simulate a positive rake angle, it is difficult to grind positive rake angles into insert t without destroying the long life vantage inherent in "on end" carb inserts. Another factor to cons is the chip space problem someti posed by the relatively heavy fr section of the holder.

In comparison, a brazed tool a from its smaller bulk, also is usu ground with a secondary relief wh gives some added space for c clearance. The problem is parti larly acute when several tool hol are mounted close together. C breakers that keep chips short easily managed will usually fores this difficulty.

Serrations Are Die-Broached

FORCING of broaching dies over ends of long steering column sh accurately forms serrations broaching back of the threads on shaft end. Shafts are broached at a time by an automobile produ columns being set into sockets in base of a 20-ton, 12-inch stroke draulic assembly type press. T are clamped with movable slides each side and are broached in pass with one-piece dies having one set of teeth.

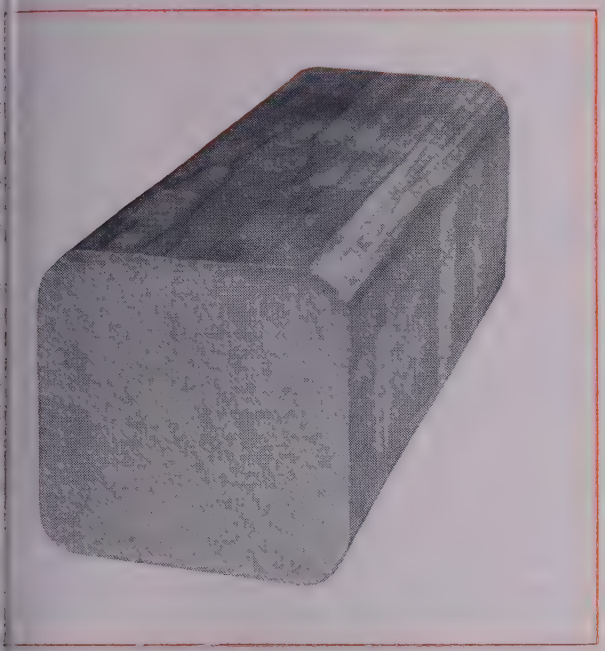
According to Colonial Broach Detroit, builders of the installat an advantage of the setup lies in simplicity of broach sharpening, only operation required being grinding off of the top face. W is set at a slight angle and the turned during the grinding so t the correct hook is produced on cutting face.

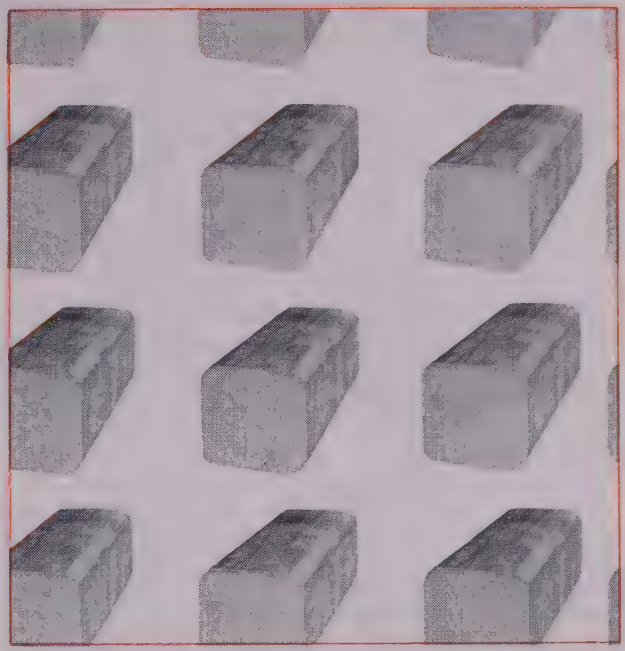
Pressure Vessel Code Offere

RULES for the construction of fired pressure vessels are covere the 1950 edition of section eight the ASME boiler construction c published by American Society Mechanical Engineers, New York embodies all code revisions that h taken place since the 1946 edit

The 1950 edition covers carbon low-alloy steels only, the rules nonferrous metals, cast-iron high alloy steels still being in p aration. Stress tables are based a safety factor of four instead five as in the previous code.

Why you get the most for your money with TIMKEN® forging bars





1. SUPERIOR SURFACE AND INTERNAL QUALITY

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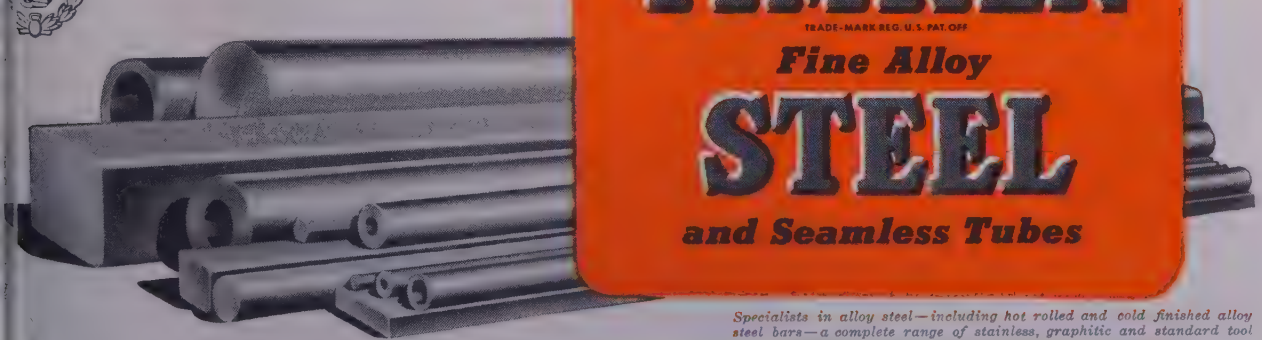

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By E. W. DAVIS
Director, Mines Experiment Station
University of Minnesota
Minneapolis

IRON ORE

Its Mining, Beneficiation and Reserves

Iron ore beneficiation, herein described by the author, is much more widely used on the Mesabi range than in any other district. Shipments of concentrate from the Mesabi and Cuyuna ranges hit a peak of nearly 18 million tons in 1942, and since have averaged about 15 million tons annually

PART II

BENEFICATION, in the broadest sense, is any operation performed on ore after it is mined to increase its value and usefulness. This includes simple operations such as crushing, screening, sorting, etc., and also more complex operations involving fine grinding, followed by mechanical, electrical or chemical sorting and drying or agglomeration by heat. These more complex and expensive operations are usually grouped under the heading of concentration since the final product is a concentrate in which the valuable mineral has been collected into a smaller bulk by the elimination of undesirable diluents. Type of beneficiation treatment that is used depends upon the exact nature of the mined ore and the product required for marketing.

As cost of blast furnace fuel rises and specifications for finished steel become more exacting, smelting plant operators become more critical of the iron ore they receive. Structurally the ore should not be in large lumps because they heat up and reduce too slowly in the blast furnaces and it also must not be too fine or it will blow away as dust. What is desired is ore that contains no lumps much larger than 2 inches, certainly not larger than 4 inches, and which also contains little or no material finer than ⅛-inch. The ideal would have all partic about the same size, say ¼ or ¾-inch in diamet However, most of the ore received by smelters is of this structure. The great majority of direct-sh ping ore from the Mesabi, for example, conta everything from 3 or 4-inch lumps down to the fin dust. In the past it contained lumps as large 12 inches or more, but now most of this material crushed before shipment and sometimes the f dust is screened or washed out before the ore ent the blast furnace.

Smelting plant operators are also particular ab the analysis of the ore they receive. For metall gical reasons the operators using lake ore want average of about 8½ per cent silica in the mate they feed to their furnaces. They do not want silica much under that but neither do they want to be much higher because this reduces furnace pacities and increases operating costs. Again metallurgical reasons they want the ore's sulph content as low as possible, certainly not over 0 per cent, and for most purposes, desire the ph phorus content to be within the same limits. Sh ments from the Lake Superior district over the p 20 years have averaged about 8½ per cent sili 0.09 per cent phosphorus, and 0.02 per cent sulph

An ideal Lake Superior furnace ore for smelti in modern blast furnaces would be −¾-inch +

Fig. 5—Exterior view of a modern sintering plant at the ore mine

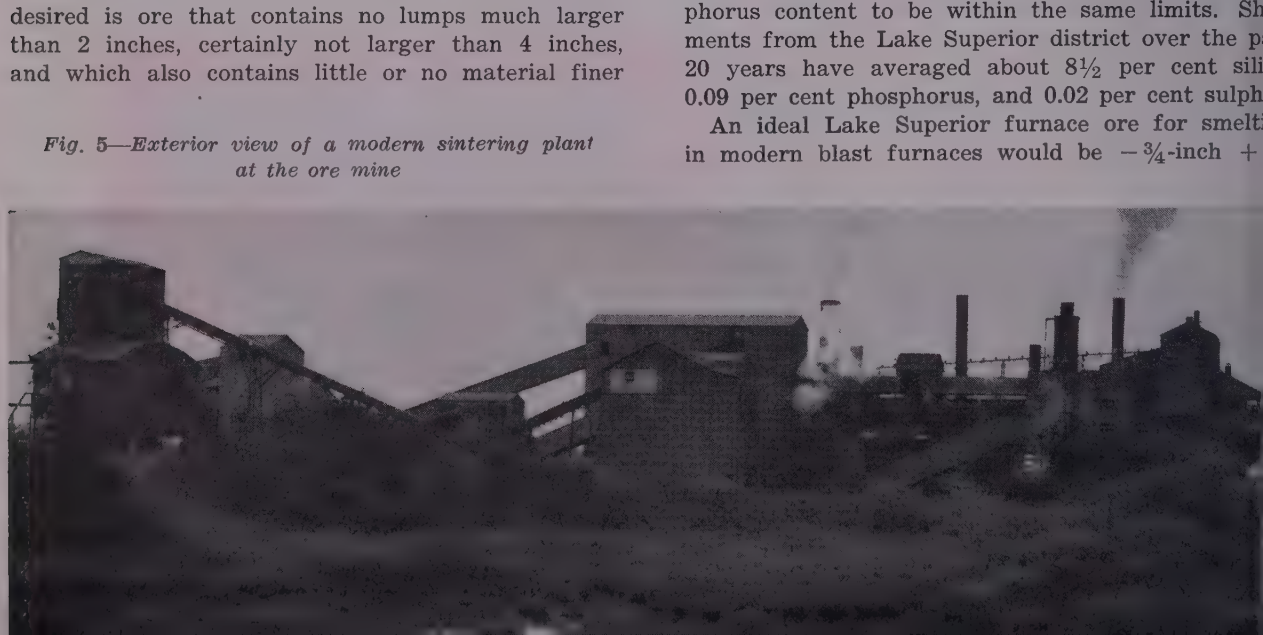


TABLE V
Screen Analysis of Typical Wash Ore

	% Wt.	% Fe
ude Unsized	100.00	48.74
1.050 in	7.00	49.50
.742 in	3.24	56.25
.371 in	13.50	58.95
4 Mesh	12.27	58.58
8 Mesh	9.30	56.55
14 Mesh	7.83	52.20
28 Mesh	4.52	54.45
48 Mesh	8.66	54.00
100 Mesh	10.42	50.55
200 Mesh	9.83	38.25
200 Mesh	13.43	20.85

ch hematite and analyzing about 52 per cent iron natural), 8 per cent silica, 0.05 per cent phosphorus nd under 0.05 per cent sulphur. If it contains a ttle alumina, so much the better.

Ores of various grades and types are mixed near ne loading docks and furnace plants to produce verage grades that best suit the operating plant which they are to be dispatched. This mixing produce desired grades is a very important operaon and each ore-producing operator must study ne ores available to him in order to determine what rades he can guarantee for each shipping season. o produce the grade desired by a customer may volve mixing ores from several properties and the roduction of a certain grade or type of concentrate. or this, as well as for other reasons, beneficiation lants are often constructed and equipped to produce grade or type of product that, if shipped without ixing, would be entirely unacceptable because of hemical analysis, physical structure, or because of ost considerations.

Iron ore beneficiation is much more widely used n the Mesabi range than in any other district. hipments of concentrate from the Mesabi and uyuna ranges hit a peak of nearly 18 million tons 1942, and since that time, have averaged about 5 million tons annually. Over this same period the nount of crushed and screened ore shipped from innesota has averaged about 20 million tons anually but this type of beneficiation has become so eneral that accurate statistics are no longer availble.

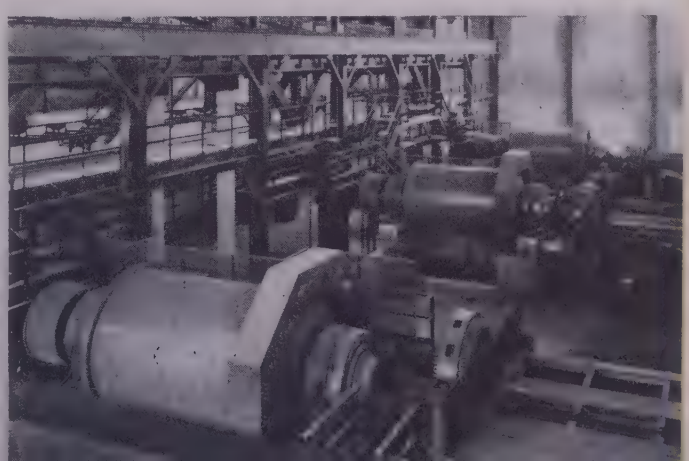
Early in Mesabi history a type of ore was enountered toward the western end of the range that isted in large quantities and was easily mined but halyzed too high in silica for direct shipment. Howver, the silica existed in the form of fine, free sand nd good ore particles in the form of comparatively arse lumps. Concentration of this material was very simple matter as all that was required was ne washing away of the sand, leaving lumps of very esirable iron ore, both from the standpoint of chemal analysis and physical structure. This material, nown as typical wash ore, is well described by the reen analysis shown in Table V.

As early as 1907 Oliver Iron Mining Co. began conntration of this so-called wash ore at its Trout ake plant. Their success brought others into the eld and by 1916 four million tons of washed conntrate were being shipped annually. Since 1940 hipments have averaged better than 10 million tons nd during the peak year of 1942, reached 14 milon tons. To date, 218 million tons of washed concentrates have been shipped from Minnesota, which is about 13 per cent of all the ore shipped from this state.

As now practiced the washing operation is usually preceded by a crushing step which reduces the maximum size of the ore particles to approximately 3 to 4 inches and, in some plants, to a considerably finer size. This crushed material is then washed on trommels or screens, the oversize being finished concentrate and the undersize going to log washers or some other type of washing equipment which separates the coarse ore from the sand. The sand product, which necessarily contains some good, fine ore, then goes to classifiers of various types in which the final separation is made. Percentage weight of the total ore recovered as final concentrate varies greatly at different plants but is usually between 50 and 80 per cent. The grade of concentrate also varies widely but the district average, at the present time, is approximately 12 per cent silica. High quality wash ore of the type shown in Table V has largely disappeared. While silica is now a little high in most washed concentrate the structure is still excellent. It is in great demand, particularly for mixing with low-silica, direct-shipping ores of inferior structure. Strange as it sounds, besides removing silica, washing also removes water from the ore. The concentrate is often lower in moisture than the crude ore because clean lumps drain drier than when they are coated with sand and silt.

While washing is by far the most important method of iron ore concentration on the Mesabi and Cuyuna ranges other methods are in use that normally produce 2 to 3 million tons of concentrate annually. Jigging was an important contributor until the advent of the heavy media process which has now largely supplanted it. Jigging was introduced by Butler Brothers in 1924 because they encountered in their mining operations considerable ore of a wash-type but in which some of the silica existed in pieces too large to be washed away. Before jigging is attempted the ore is ordinarily crushed to about 1-inch in size and washed for the removal of fine sand and silt. The whole product is then jigged either without sizing or in sized fractions. Material finer than 6 mesh has always been difficult to concentrate by gravity means and new machines are constantly being

Fig. 6—Battery of rod mills is seen in this interior view of a concentrating plant processing New York state (hematite) ore



developed and tried out in the various plants for treatment of this size fraction. Hardly any two plants handle their fine ore concentration problems in the same manner.

For a number of years prior to 1945 shipment of jig concentrate in Minnesota amounted to approximately one million tons annually reaching a peak in 1941 when 1½ million tons were shipped. Butler Brothers, with their two plants at Nashwauk, have been consistently the chief producers of jig concentrate. Since 1945, however, jigging has been largely replaced by heavy-media separation, a concentration method developed for iron ore and introduced into this district by Butler Brothers about 10 years ago. Since 1945 heavy-media concentrate shipments have averaged about one million tons per year and shipment of jig concentrate has decreased to under one-half million tons per year.

Heavy-media separation for iron ore concentration consists first in preparing a high density fluid of finely-ground, high-silicon iron and water. The iron used assays about 14 per cent silicon, the requirement being to have silicon as high as possible to prevent oxidation and still not so high as to make the metal nonmagnetic. With a powder of this kind maintained in suspension in water by a small amount of agitation, a nonviscous fluid can be produced having a gravity as high as 3.4 if desired.

Into this high gravity fluid iron ore is fed, usually having been crushed to −1½-inch, washed, and then screened at ¼-inch or 6 mesh for removal of the fines. If gravity of the liquid is held at 3.2, for example, all particles of ore having a gravity higher than 3.2 settle to the bottom of the container and can be drawn off as concentrate. All particles having a gravity less than 3.2 float to the top and are skimmed off and rejected as tailing. It is, of course, necessary to wash and screen both the concentrate and tailing for recovery of the high silicon iron and this material, after being dewatered and cleaned magnetically for removal of slime and sand, is again ready for use. Ordinarily, the loss of high silicon iron amounts to about ½-pound per ton of ore treated.

This process is not now used for concentration of ore which is finer than 6 mesh. Fine ore is classified by any one of several methods and, ordinarily, an acceptable product can be made. However, much work is now being done on concentration of fine ore particles because of the desirability of produc shipping grade concentrate under 10 per cent sil There is some indication that the heavy-media proc may be so modified as to operate efficiently on particles down to 60 or 80 mesh in size. This wo be an important improvement because it would mit finer crushing and even abrasion grinding coarser material which would result in the proc tion of lower silica concentrate.

Fig. 7—Linney-type magnetic separators remove the finely ground magnetic ore (hematite) from the rock in which it was contained

From time to time drying plants have been ope ed on the Mesabi producing a few hundred thous tons of dried ore annually, but on the Cuyuna, ing and sintering are important beneficiation p esses at the present time. Between one-half one million tons of dried and sintered ore are ship annually from this range. The drying opera simply removes some of the moisture and, theref reduces shipping weight by a proportionate amo The sintering operation removes all of the moist most of the ignition loss, and greatly improves structure. This is a much more expensive operat however, and at the present time there is only sintering plant operating on the Minnesota ranges.

There has been practically no concentrate duced in the United States Lake Superior ranges side of Minnesota, although concentration of s of the Michigan low-grade ores is now receiving tention. Low-grade ore materials that can be mi by open pit methods are of great interest at the p ent time both in Michigan and Minnesota but grade ores requiring underground mining are of terest only in exceptional cases because of the h mining cost.

There has been great activity throughout the L Superior district during the past few years in quiring lands known to contain a type of low-gra iron-bearing rock called "taconite" in some locali and simply "iron-formation" in others. Amount this type material in the Lake Superior distric enormous and the mining companies in need of reserves are carefully studying methods requi to concentrate this material. Laboratory and pi plant work in the Lake Superior district is very tive at the present time, and if the mining c panies decide they can beneficiate the iron for tion economically, concentration in this area be greatly expanded.

Practically all ore produced in New York Pennsylvania is concentrated. Much of it is mi by underground methods and, on the average, so thing like two tons of ore are mined and proce to produce one ton of shipping product. These are all basically magnetite and concentrated prima by magnetic concentrating methods. In genera consists of crushing, followed by fine grinding rod and ball mills to 10 mesh or finer, followed magnetic concentration. The concentrate produ is high grade but too fine for blast furnace smel and, therefore, is sintered to produce an excel furnace ore. At several plants the nonmagn tailing is retreated to recover additional values. MacIntyre in New York ilmenite is recovered f the nonmagnetic fraction and at several of the o plants martite is recovered. At the Lebanon p

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Fig. 8—Washing plant and car loader in operation on the Mesabi range

of Bethlehem Steel Corp., copper, cobalt and sulphur are recovered.

At a number of these plants some comparatively coarse concentrate is recovered before fine grinding. This is shipped to steel plants and used directly in open-hearth furnaces. At some plants coarse waste rock is rejected and in other eastern plants sale of this rock reject for highways and concrete-making purposes is an extremely important economic consideration.

All of these plants were originally operated using dry concentration methods. Many were equipped with dust-collecting systems, however, they did not entirely keep the plants from being dusty. As dust hazards became better recognized the plants were gradually changed over to wet grinding and concentrating operations. The result has been the complete elimination of dust and also an improvement in metallurgy because separation of iron minerals from the waste rock can be made much more complete by wet concentration. In addition to this, the wet concentration method places no limit upon the fineness to which ore can be crushed and, therefore, a much higher grade product can be produced. All plants now in operation in New York and Pennsylvania use wet concentrating methods.

Concentration of Birmingham district brown ores has been carried on for many years and it's believed the Minnesota-type log washer had its origin in the south's brown-ore districts. Originally, this machine was a real log set to rotate in crude bearings in an inclined trough. Steel paddles, or just heavy spikes, were attached to the log in the form of a continuous helix so that, when rotated in a wet mass of ore and flowing water, the heavier and larger ore particles were carried up the slope and discharged at the upper end while the lighter, earthy pieces overflowed a dam at the rear. Modern log washers work on this same principle but are of heav steel construction.

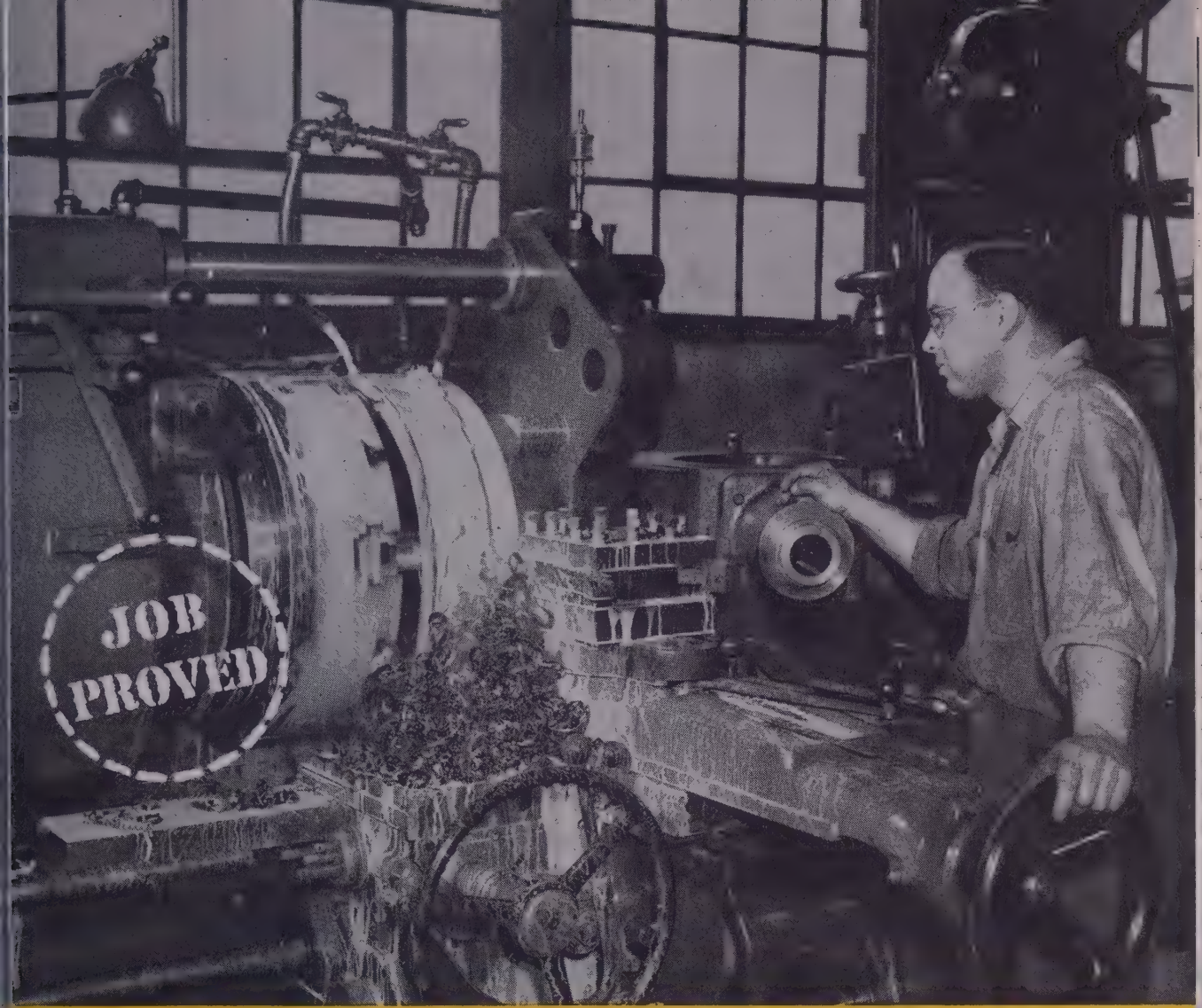
Normal production of brown ore concentrate ave ages around half a million tons annually, but durin war years, it was increased to a little over a millio tons. This output comes from a number of properties many of them quite small. Brown ore concentra is highly limonitic, and if the silica is low, it is qui desirable blast furnace feed.

Red ores form the principal supply for blast fu naces in the Birmingham area and this type m terial is difficult to concentrate. As mined, red or contain only 30 to 40 per cent iron and need f concentration has been felt for many years. Th iron minerals are hematite and limonite and, du to the structure, the ore must be ground fine befo the iron particles are freed from the worthless gangu minerals. Several concentration methods have bee attempted on a commercial scale but the only plan now in operation is that of Republic Steel Corp. a their Spaulding mine. Here the ore is crushed an ground to a fine size and then concentrated by combination of hydraulic classification and tablin Real trick of this process, however, is to adjust th operation of the grinding mill to process the softe iron minerals and leave the harder, gangue minera as comparatively coarse grains of sand. The Spaul ing plant now has a capacity of about a quarter a million tons of concentrate per year, all of whic is sintered before being charged to the blast furnace The Birmingham district is handicapped because of lack of high-grade ore. There is some indication tha in place of expensive and somewhat inefficient co centration operations it may be more economical t import high-grade ore from South or Central Ame ica for mixing with the local red ore that exists i such large quantities.

Limited amounts of ore are concentrated at othe places in the United States using methods that hav already been mentioned. At Iron Mountain, Mo the M. A. Hanna Co. is operating a washing and jig ging plant at the old Iron Mountain property tha has produced iron ore spasmodically since befo the Civil War. In Texas practically all ore produce is washed, classified and concentrated by one metho or another for the removal of sand and clay. I Utah and Wyoming attempts have also been mad to concentrate some of the ores but at no place ha concentration even approached the position of impo tance that it occupies on the Mesabi range in Minn sota.

As the high-grade ores of the Mesabi are exhauste concentration is certain to become more and mo important. This does not mean that the cost of pr ducing iron and steel will necessarily increase b cause of the increased costs of producing the or Technological improvements have more than ke pace with rising costs in (*Please turn to Page 9*

Fig. 9—New York state iron ore bearing rock is first crushed to sand form and the iron removed by magnetic separators. The crushed ore is then fused by mixing it with coal and subjecting it to a high temperature in a process known as "sintering". Large building on right contains the separating equipment and building on left is the sintering plant



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Tools: Firthite carbide tools.
Feed: .012 at 31 rpm.
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Service System

(*Continued from Page 70*)

level cups, and numerous other ite make the job easier and more e cient.

Servicing Time Reduced — Ove year ago the lubrication departm serviced 129 machines with strai cutting oils in a test case. It found that the servicing time cut by 75 per cent under the tim took the operators of the machi to do the job. Needless to say, go-ahead signal was given on balance of the machines and on rest of the cutting and coolant The checking and ordering of th oils was taken over first. This quainted us with the type of and quantities so that charges wo be prorated to the various gro correctly. In order to satisfy eve one a list of machines, together w their numbers, in each forema group, was prepared. These w given to the foreman with a requ that he insert the name of the c ting oil being used, and in the c of a coolant to include the mixtu Meanwhile, all the coolant tanks the plant were measured so that exact gallon capacity was record Pump displacement was also ta into consideration.

The returned lists started com back and showed that twice the nu ber of men would be needed to p pare all the various mixtures quested. After a consultation w the chemical laboratory, which c trols the selection of new cutting and coolants, and general foremen the productive groups, it was deci to extend the control of the mixtu and oils to the lubrication depa ment. This situation is mentio only because it is typical when erators service their own machi The servicing of one straight c ting oil was taken at a time to av confusion. A tag was attached each machine bearing the mach name, number, bay and name of oil used. When this was complet the coolants, one oil at a time, only part of a division were adc Here again tags were hung on machines. Mixtures, number of g lons of oil that have to be used in event the tank has been cleaned tank cleaners and refilled with wa were included on the information t

In the event a tank is low and quires a mixture of water and the lubrication service man adds t mixture. It should be stated that sections were made smaller. A lu cation man is responsible for ser ing coolants and cutting oils al with lubricating oils and greases.

xisting drops for water, paraffin oil, tc., were put into use, and wherever ecessary additional drops were in-talled, suitable hoses attached to hese drops so that machines in the rea could be serviced direct from he line to the machine. Special reels ere purchased that remain attached o the faucet while unreeling or reel-ng in.

Fifty-five-gallon drums were set up n four-wheel dollies in which soluble il and water are premixed in exact roportions desired. These drums are ushed from one machine to another hen it is necessary to replenish the upply. Flow of water was timed at everal outlets and found to vary in ifferent sections of the plant. Know-ng the gallon flow, it is possible to ll large tanks with water direct rom the hose by figuring gallons on time basis.

The proper amount of oil is then dded, depending on the number of allons of water. Calibrated measur-ng sticks were made for large reser-oirs so that they could be measured o determine how many gallons of ater were added. Knowing this, the orrect amount of soluble oil is added. ate of water evaporation was also gured so that at specified intervals ater was added to make up the eficit. Now that tanks are kept at he proper levels, pump life has in-reased and the draining of tanks is et at lesser frequencies than was rmerly necessary.

Laboratory Supervision—No change cutting oil or coolants can be made nless an approved cutting or cool-nt change form is first signed by he laboratory, lubrication depart-ent, and finally by the department ead of the production group. There ave been very few changes request-d as a result of instituting this form. lso, if a test is to be run on a new l, the three persons mentioned bove sign the test approval form. he form provides spaces for a re-ort of performance which is re-rded daily by the lubrication de-artment and submitted to the lab-ratory, and which makes the final ecisions.

When the cutting oil program was mpleted, the ordering and servic-g of general purpose oil was turned er to the lubrication department. ow the operators of machines who e paid a higher rate than the lu-rication service men spend 100 per nt of their time on production. hen operators lubricated the ma-hines themselves, cost of the job as higher and much production time as lost.

With reference to the frequency of brication schedules, recommenda-

SO SMO-O-O-TH: By blending all grit marks on mass produced cold rolled steel bumpers to permit a smooth chromium plate application, Sharonville, O., plant of Auto-Lite is reducing production costs and number of rejects. Power brushes supplied by Osborn Mfg. Co., Cleveland are incorporated in the 2100 rpm multihead polishing machines. A nine-head rotary machine polishes the bumper edge, followed by a 12-head in-line machine for the bumper face and eight tandem machines for the curved ends. After a cleaning bath prior to copper and nickel plating, bumpers are cut and color buffed in preparation for the chromium plate

tions, etc., all this information is recorded in a visible file which contains a card for every machine and/or equipment in the plant. This is necessary since some machines are constantly changing locations, and new ones are coming in. These cards, see accompanying illustration, give complete information about lubricating oils, cutting, coolant and general process oils in any machine. The cards bear the following: Name of machine, number, location, and division on the bottom line so it is plainly visible in the file. In the upper left corner are the numbers 1 to 35, each number represents a category of lubrication. The various lubricants are lettered, making it an easy matter to print the code of the oil opposite the category found on the machine.

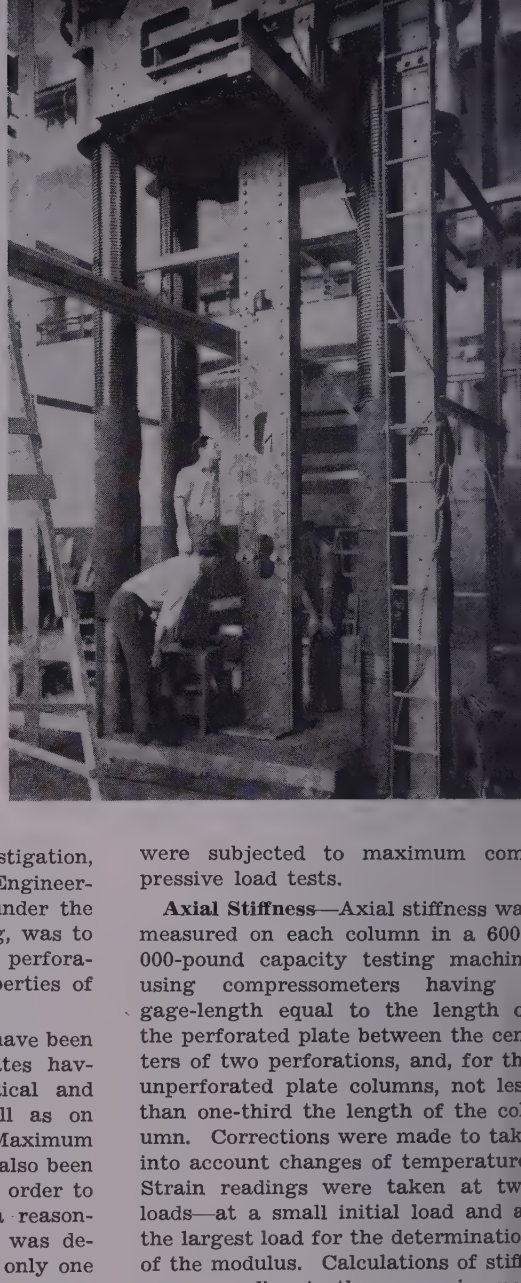
A simple example of this system would be 1-H, 2-C, 19-S. No. 1 represents hand oiling with H-oil, 2 represents spindle with C-oil, and 19 represents motor grease with S-grease. Codes eliminated 75 per cent of the typing that was formerly found to be necessary.

To the right of this box is a place to list materials used for added accessories on a new machine. The next box to the right is used to record the gallon capacity of each reservoir found on a machine. Below and in the first wide column the number of the category is listed which is scheduled at intervals of 3 months or longer. In the next column the frequency is listed by the numbers of months. To the right and in the column next to the double line, date machine was serviced is recorded. Next column is used to set up the next scheduled date. At the bottom, J, F, etc. represent the months of the year. The file is checked at the end of the month and all the scheduled work for the next month is recorded on a work sheet and is given to the supervisor for further handling. When the work is completed and checked off, the sheets are returned to the office and the next service date is set up.

Cutting and general purpose oils are more or less self explanatory. Numbers are used for straight cutting oils from 1 to 19 and numbers in increments of 10 from 20 up to 90 for coolants. The tags are now in the process of being eliminated and the soluble oil codes will be imprinted on the tanks, in the following manner: If the oil is No. 20, the zero will be dropped, if the mixture is one to 40, the one and the zero are dropped and if 3 gallons of oil are to be added for the make up of a full tank the result will be 243. The general purpose oils are identified on equipment C-1, to C-5, C for cleaning, R-1 to R-5, R for rust preventives, T-1 to T-5, for testing fluids, etc.

PERFORATED COVER PLATES

. . . improve strength of structural steel columns



Data on such properties as axial shortening, deflection at midheight of the column and maximum load of perforated cover plates were obtained from the maximum-load test in the 10-million pound testing machine at National Bureau of Standards. Note compressometers on the column for measuring these properties

A STUDY of the mechanical properties of perforated steel cover plates for bridge columns, utilizing full-scale models, indicates that strength of columns built from the plates and angles is greatly enhanced. Formulas were derived that may be applied whenever data are required concerning displacements in a structure having perforated members; the validity of these formulas was confirmed by experiment. It was found that the net area of a perforated-plate column may safely be used for design purposes even for a perforation shape that produces great stress concentration.

The tests, carried out by the National Bureau of Standards over a period of years, in co-operation with the American Institute of Steel Construction, consisted of investigations of the cover plates with respect to stress distribution, strength and axial stiffness. The experimental results of these tests proved to be in close agreement with theoretical predictions; they provide engineers with a rational approach to the design of bridges using cover-plate columns.

Box-type Cross Section — Most large compression members of bridge trusses have a box-type cross section in order to provide efficient utilization of the material in resisting column action. It is desirable to provide openings in the member to allow access to the interior for inspection and painting; common practice is to use two channels (or four angles and two web plates) with a cover plate on one side and lattice bracing or battens on the other.

Lattice bracing or battening serves to brace the flanges of the channels or angles and to transfer shear so that the full moment of inertia of the remainder of the cross section is developed, but it does not contribute to the cross-sectional area effective in resisting thrust. Recently a more economical design in which the bracing is replaced by a perforated cover plate has been used (see photo). The purpose of the bureau's investigation, which was conducted in the Engineering Mechanics Laboratory under the direction of Dr. A. H. Stang, was to determine the effects of the perforations on the structural properties of these plates.

Tests in the elastic range have been made on columns with plates having circular, ovaloid, elliptical and square perforations, as well as on columns with solid plates. Maximum compressive-load tests have also been made on these columns. In order to limit the investigation to a reasonable number of columns, it was decided to use cover plates of only one thickness, namely, ⅜-inch, and to use 8 x 4 x ½-inch steel angles with the plates to complete the columns. Plates and angles were open-hearth low-carbon steel. The cover plates were 15, 20, 25½, and 30 inches wide and 14 feet 9 inches long. Columns for the tests were made with each type of perforation in each width of cover plate. In addition, three different spacings of the perforations were used. For control, three unperforated plates of each width were made into columns to be tested.

Both perforated and unperforated plates were subjected to compressive tests in the elastic range with two angles or with four angles bolted to them. After these tests were completed; specimens consisting of a plate and two angles riveted together were subjected to maximum compressive load tests.

Axial Stiffness—Axial stiffness was measured on each column in a 600,000-pound capacity testing machine using compressometers having a gage-length equal to the length of the perforated plate between the centers of two perforations, and, for the unperforated plate columns, not less than one-third the length of the column. Corrections were made to take into account changes of temperature. Strain readings were taken at two loads—at a small initial load and at the largest load for the determination of the modulus. Calculations of stiffness according to theory are in good agreement with the experimental values, differing, except for a few scattered values, by not more than plus or minus 0.02. The general tendency is for the experimental values to be less than the theoretical.

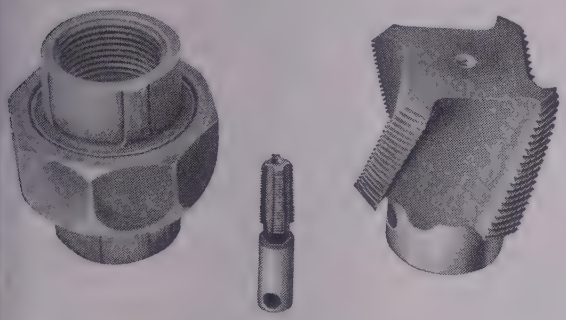
For many of the columns, the complete stress distribution over the middle bay of the cover plate was obtained from hand strain-gage readings. A novel feature of this work was the arrangement of the rosettes. Strain-gage holes for 2-inch gage lengths were drilled on both sides of the plate in a continuous equilateral triangular pattern so that each hole (except those near edges) served for six gage lines. This arrangement provides uniform coverage of the area with a minimum of gage holes and

look what can happen when you

refuse to be satisfied with "EXPECTED PRODUCTION"

from tools and dies . . .

Many tooling men have said: " . . . Our tools are running ong O.K.—things are satisfactory". Yet, after these men iscovered a more foolproof way to select the proper steel for the job, they wondered why they were ever satisfied with "average" tool and die performance. And look at the results they are enjoying:



perators Objected to the Change
. . But Now They Are Convinced!

veryone claimed these taps for threading cold forge unions ere running along "O.K.". But the T.R.F. wasn't convinced. e used the Carpenter Matched Set Method to pick the one eel best suited for the job—SOLAR (Water-Tough). Now oduction is up 350%—and today the operators *insist* on taps ade from SOLAR! It can happen in your plant—if you *refuse* be satisfied with "Expected Production".

Production Was Considered "Satisfactory"
. . . But That Didn't Stop This Toolmaker:

This die preforms tablets from Bakelite powder on a preform press. Even though the highly abrasive plastic created a wear problem, production was considered "satisfactory". Yet, in a desire to investigate every possibility for reducing costs and boosting output, the toolmaker changed to a steel in the Carpenter Matched Set. Now, with K-W (Water-Wear), the die lasts twice as long as those previously considered "satisfactory" —and 8 to 10 hours are saved between grinds!

xisting production records *are* being broken daily, tools nd dies *are* producing more, giving less trouble. And oling men who are no longer satisfied with "Expected roduction" are cashing-in on lower costs. The Carpenter atched Set Method has *proved* it can help you do the me. Best of all, it is amazingly easy to use because it is simplification itself! It simplifies selection, heat treatment, inventories—practically all toolmaking operations. You'll never know the job it can do unless you try it. Prove it to yourself—it's easy. Simply pick out a job—put the Matched Set Method to work—then compare results!

Export Department, 233 Broadway, New York 7, N. Y. "CARSTEELCO"

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TOOL & DIE STEELS

ffices and Warehouses in Principal Cities Throughout the U.S.A. and Canada

IE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

readings. Very careful jigging of the holes was required to keep all the gage lengths within the small range of the Whittmore strain gages used. From the data obtained, all of the elements of the stress distribution were computed and presented graphically as isograms of principal stresses and their directions.

Stress Distribution—Distribution of stress on the edge of the perforation at mid-height of each column was obtained from strain-gage readings taken by hand. These stresses were compared with values computed from a theory derived by Martin Greenspan of the bureau staff, in which an exact solution to the problem is obtained for a hole having any boundary of which the equation can be expressed in certain parametric forms. In general, the agreement between theory and measurements is good although in many cases the measured stress exceeds the theoretical value at the position of maximum stress.

Twenty-four two-angle columns, as well as four controls (solid plates) were tested to destruction. Most of the columns failed by bending away from the plate side as would be expected because of the local eccentricity near a perforation.

Iron Ore

(*Concluded from Page* 84)

the production of other metals from lower grade ores and the same can be expected for iron and steel. Recently some experiments were made in the smelting of high-grade, agglomerated, magnetic taconite concentrate from the Mesabi range. These tests indicated a much lower coke consumption in the blast furnace and a much higher production rate of metal than with standard ores. Processed ores are really tailor-made for subsequent smelting operations, and while it may cost more to process and prepare the ore, the saving that can be made in transportation and smelting can actually provide cheaper metal in some instances than from ores that are high-grade as mined.

(*To be continued*)

Red Lead Protects Steel

STUDY of some 34 kinds of protective systems by Battelle Memorial Institute, Columbus, O., and American Iron and Steel Institute, New York has shown that red lead appears to be highly satisfactory for enclosed structural members in steel housing construction. Experiments with the coatings included continuous immersion in water, contact with air at high humidity, continuous condensation, alternate wet-dry conditions and continuous contact with insulation in the presence of water.

Tests were intended to stimulate both severe and moderate conditions of service and to form a basis for valid comparisons between the effectiveness of the various systems studied. AISI report No. 31 reported that red lead has a good blister rating and affords protection to the base metal as evidenced by low weight loss and slight visual evidence of attack on steel.

Tool Practice Films Offered

SIX educational-type slide films covering carbide single point tool practice are available in kit form from Carboloy Co. Inc., Detroit. Based on information contained in the company's recently released carbide tool manual, the films amplify a similar set released during the war.

Included are six booklets containing sections from the manual covering and supplementing material presented in the film. Books are said to serve the dual purpose of serving as a shop reference and permitting a more detailed study of the carbide "know how" set forth in the films.

Steel Alloys Resist Corrosion

ELECTROSTEEL alloys with fundamentally improved chemical and corrosion resistant properties are a development of Uniworld Research Corp. of America, Cleveland. All grades of these steels can be melted in the usual electric arc and induction furnaces from readily available raw materials. They are not sensitive as to their carbon content and are said to have good castability, smooth surface and may be machined, ground and polished.

Crane for Various Operations

EASILY convertible to a magnet, ½-yard dragline, clamshell, shovel or trench hoe, is the 7.5-ton, crawler-mounted industrial crane, announced by Wayne Crane Division of American Steel Dredge Co., Ft. Wayne, Ind. Known as the model 66, it is powered through direct-drive propeller shaft assembly from a "direct power flow" transmission which is remotely located from the power unit and connected by a right-angle drive and universal drive shaft.

Power is furnished by a 6-cylinder gasoline engine developing 62 hp. Other makes of diesel or gasoline engines of required power and speed may be furnished.

LETTERS
to the Editors

Heatless Welds

We note from an article in of our local papers, namely, *The M waukee Journal,* that there was article published in STEEL announc a new development of a welding p cess—a technique that permits pie of metal to be fused without use heat, electricity or chemicals, by W liam Dubilier, founder of Corn Dubilier Electric Corp. and that th has been a new company formed, Koldweld Corp.

We are wondering if you have information pertaining to this proc in your files, or if you know how can get in touch with this compa

R. J. Hess
Purchasing Agent
Alloy Products Corp.
Waukesha, Wis.

We read with much interest article on Heatless Welding in Nov. 7 issue of STEEL. The arti is on page 109 under the Product and Engineering News at a Gla column. We would like very mu to have more information about t type of welding.

H. C. Henderson
Goddard & Goddard Co.
Detroit, Mich.

The process was also covered in an arti "Heatless Process May Change Wel Practice." on page 117 of the Nov. issue of STEEL. For more information w Mr. William Dubilier, president, Koldw Corp., 10 E. 40th St., New York, N. Y.— Editors

Pricing Compliments

I would like to offer my congra lations on the development of y new method of quoting prices STEEL. It is certainly the most co plete setup that has ever been vised and will surely be of great h to all of the readers of your ma zine who are interested in the buy and selling of steel products.

F. G. Syburg, Chairman
National Committee on Steel
National Association of Purch ing Agents
New York, N. Y.

Gears, Planetary

We would appreciate it if you co forward to us names of compan which specialize in manufactur planetary gear drives.

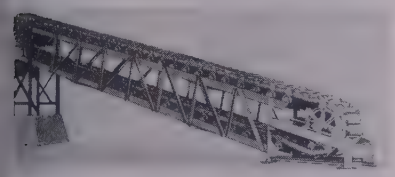
Hans Lieb
Great Lakes Industries Inc.
Duluth, Minn.

List of manufacturers being forwarde The Editors

achine Cast Pigs

Complete and self-contained, the undry pig casting machine manuctured by William M. Bailey Co., ttsburgh 16, Pa., may be erected herever convenient and moved by ane or other means to any desired cation. It consists of the machine oper, motor, gear unit, variable eed reducer and drive.

Slight wear that occurs as the 15-ch cast link chain moves over the



d sprocket wheels is confined to e high manganese steel bushings id pins. Machine can be furnished lengths from 15 feet to 100 feet or nger in multiples of 5 feet. Posining of the unit may be to load the gs directly into the cars if desired, us reducing handling costs.

eck No. 1 on Reply Card for more Details

ont Wheel Drive Crane

Featuring front wheel drive for full action at all times, the Karri-Go ton front boom industrial crane, anufactured by Silent Hoist & Crane ., Brooklyn 20, N. Y. is steered by

heels at the rear. Load rides on a ad axle. Crane can climb a 10 per nt grade with full load on the hook. Four speeds forward up to 14 mph id 1 speed in reverse are provided. n auxiliary reverse transmission is ailable, providing all forward speeds r traveling in reverse. Safety feares built into the crane include rge engine hoist and auxiliary units, wering and raising of boom by wer, and single lever control of isting, power reverse-gear lowering id holding in neutral. No part of the boom, cables or chains passes over the operators head. Load is held by automatic braking.

Check No. 2 on Reply Card for more Details

Multipurpose Broaching Unit

Universal ram-type hydraulic broaching machines, introduced by Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich., may be used interchangeably for all conventional broaching operations, including surface broaching, internal push-broaching, slotting and press work. Machines are available in 4, 6 and 10 ton capacities with 24 and 36-inch strokes.

Hydraulic system provides excess

capacity for occasional overloads. Ram operating piston rods are protected so as not to be exposed to chips or foreign matter. The coolant system has its own separately motorized impeller type pump. Machines can be furnished with special circuits for operating receding tables or fixtures.

Check No. 3 on Reply Card for more Details

Pressure Cell Line Expanded

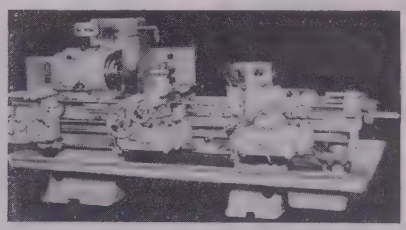
Five new SR-4 type load and pressure cells extend the range of standard models on both low and high sides, according to Baldwin Locomotive Works, Philadelphia 42, Pa. Sensitive elements of these cells are SR-4 resistance wire strain gages. In the load cells, SR-4 gages are bonded to a compression column, loads being indicated or recorded manually on self-indicating type instruments.

Two new compression type load weighing cells of 100,000 and 200,000 pounds have been added to the line. Size range of recently developed universal load cells for both compression and tension loads is extended upward from 50,000 to 100,000 pounds. New load beams make it possible to obtain load measurements down to 2 grams, full scale. Also added are 10 psi and 100,000 and 150,000 psi fluid pressure cells.

Check No. 4 on Reply Card for more Details

12-Inch Chuck Capacity Lathe

Completely redesigned, the model 7A saddle type universal turret lathe, announced by Jones & Lamson Machine Co., Springfield, Vt., has a 2½-inch bar and 12-inch chuck capacity.



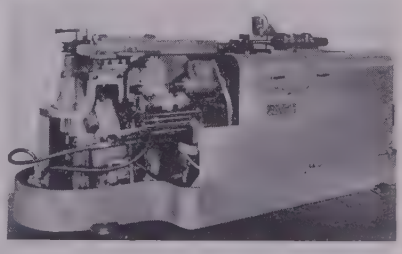
It combines advanced construction and control features with improvements to provide rapid metal removal. Design of the bed emphasizes strength and rigidity and provides for increased chip disposal facility.

Threading to maximum turning length with carriage or saddle is possible with a full length lead screw. An all-sliding-gear quick-change gear box with single lever selector provides a wide range of pitches. Cross slide and saddle are equipped with power rapid traverse and the turret is power indexed. Two ranges of 12 spindle speeds, 20 to 1000 rpm or 30 to 1500 rpm are available, with a constant speed motor.

Check No. 5 on Reply Card for more Details

Bends Tubes at High Speed

Furnished in several sizes for bending up to and including 3 inch OD ¼-inch wall or larger tubes of the same area is a high speed hydraulic automatic bending machine



manufactured by Acme-Winter Corp., Buffalo 13, N. Y. The short bending head allows the operator to work in front of the machine. Stand-

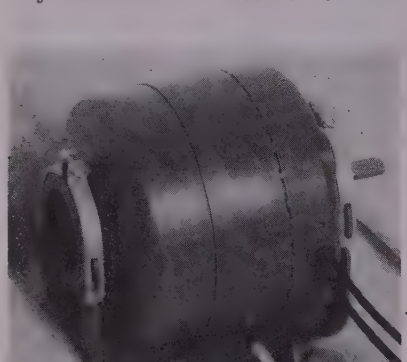
ard models are equipped with six automatic stops for various degree of bends and are indexed automatically.

Machine bends either right or left hand with the standard dies and can be furnished with hand control and automatic mandrel ejector. They may be furnished with special extension table and adjustable gages to suit customers' needs. Motor and oil tank are in the base or pan. Bending head is made of cast steel and is fitted with needle bearings. Operation is by rack and pinion.

Check No. 6 on Reply Card for more Details

All-Angle Operations Motors

Line of lifetime oil-lubricated, shaded-pole motors for operation with shaft up, down, horizontal or at any intermediate angle are being announced by General Electric Co., Schenectady 5, N. Y. The type KSP motors with frame sizes 11 and 21 may be used as drives for exhaust



and cooling fans, condenser cooling and for small pumps, agitators and blowers.

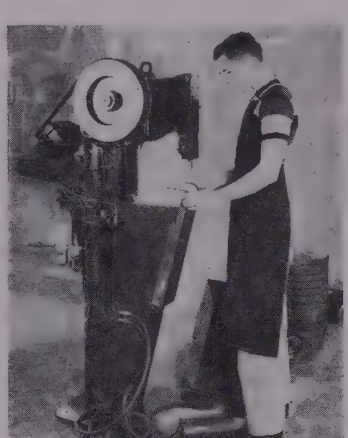
They are available in either open or totally-enclosed construction and in ratings from 1/40-hp through 1/12-hp at 115 or 230 v, 1050 or 1550 rpm, 60 cycles. Lubrication system provides a constant flow of oil from a large reservoir to the bearing surfaces regardless of motor position.

Check No. 7 on Reply Card for more Details

Machine Sets Nuts in Bracket

Using the underfeed Clinchor machine, developed by Tompkins-Johnson Co., Jackson, Mich., standard square neck cased nuts are automatically fed and set in metal brackets or other parts. Floating type cased nuts and various sizes of Fabri-Steel nuts may also be handled. Flange of encased nuts, before being set, protrudes through the square hole in the part which the operator has placed in the machine's anvil. Operation is by foot pedal.

When one nut is set, the underfeed mechanism reloads the anvil for the next operation. Underfeed machine is available in a standard model with vertical anvil and anvil guide and a special model with inclined anvil and anvil guide for setting nuts in parts

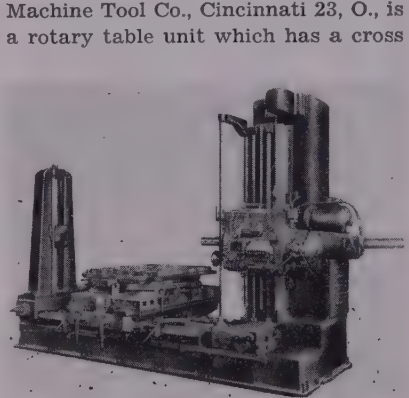


that could not be handled because of restricted clearances on the parts. Operator loads nuts into a hopper which feeds them to the anvil. Capacity of the standard machine is 9/16 to 3/4-inch OD D-type clinch nuts, 17/32 to 29/32-inch square case type clinch nuts and extruded type clinch nuts. Throat depths range from 8 to 36 inches.

Check No. 8 on Reply Card for more Details

Miller Has Rotary Table

An integral part of the horizontal boring, drilling and milling machine introduced by Cincinnati Gilbert Machine Tool Co., Cincinnati 23, O., is a rotary table unit which has a cross



feed and power rapid traverse on its saddle. Table top is clamped to its base by a 47-inch diameter ring clamp acting on an angular surface of the table top. Flat ways are lubricated by a pressure system, making it easy to revolve the table top by hand with heavy loads upon it.

Table top has a working surface 44 inches square. Other features of the machine include a single hardened 2½-inch diameter spindle with maximum spindle speeds of 1420 rpm built-in reversing motor and centralized control for all spindle speeds feed changes and feed selection.

Check No. 9 on Reply Card for more Details

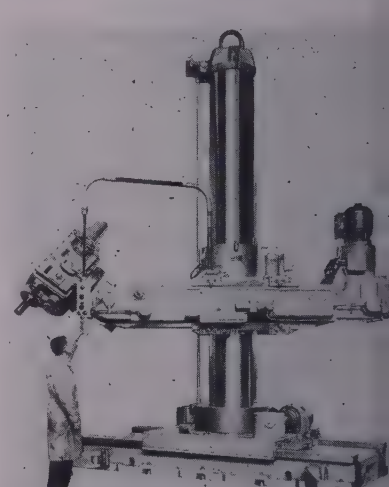
Light Weight Belt Conveyor

An aluminum power belt conveyor weighing 150 pounds and requiring sq ft of storage space, is offered by Arrow Products Inc., 417 Front Ave NW., Grand Rapids, Mich. It operates equally well horizontally and in inclined positions and is easily moved by one man. Conveyor is offered in 8 and 10-foot lengths for all types of package, carton and bundle carrying and can be coupled to Arr-O-Lite gravity conveyors.

Check No. 10 on Reply Card for more Details

Drilling and Tapping Machine

Holes may be drilled at any point in a range from 18 to 134 inches above the floor with the spindle in horizontal position on the heavy duty full-universal drilling and tapping machine available from Kaukauna Machine Corp., Kaukauna, Wis. I



provides 97-inch radial reach with the spindle in vertical position and is capable of performing all radial, horizontal or angular operations such as drilling, tapping, boring, spotfacing or reaming on a production basis. The spindle, with 18 inches of manual and power feed, has nine speeds in a choice of three ranges from a minimum of 25 to a maximum of 80 rpm.

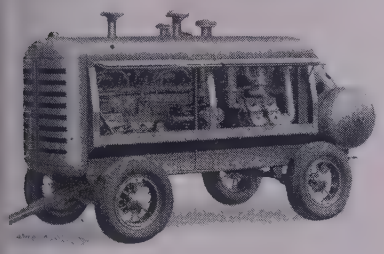
Spindle drive power range is from 10 to 20 hp and spindle head swivels 360 degrees on the trunnion and the trunnion rotates 180 degrees on the rails. Entire rail unit, carrying the spindle head, spindle drive and trans

ission, is provided with 60 inches of rtical movement on the column th power rapid traverse up and wn. Column base is on a runway nich provides 48 inches of horizontal ovement with both power rapid averse and inching in either direc-n.

eck No. 11 on Reply Card for more Details

mpressor is Diesel-Driven

Ingersoll-Rand Co., 11 Broadway, ew York 4, N. Y., is introducing a ll diesel engine drive portable air mpressor, the Mobil-Air, of 500 n size. Driven by an International-arvester heavy duty engine which arts as a low-compression gasoline-gine and after a short warmup



riod is shifted to full diesel opera-n, the IKA-500 compressor delivers at 100 psi.

A floating speed regulator slows wn the compressor to the lowest actical working speed to compress ough air to hold the pressure. her features include two-stage air-oled compressor, Hydro-Shift, Flex-ec clutch, channel valves and easily aned air cleaner.

eck No. 12 on Reply Card for more Details

• • •

REVENTS SLIPPING: Alan Wood eel Co., Conshohocken, Pa., an-unces A. W. Algrip, a new, non-id floor plate, for use on industrial ors, loading platforms, ramps, etc. ese plates combine abrasive grain d rolled steel. They are available thicknesses from ⅛ to ⅜-inch in-usive and in widths up to 60 inches aximum, by 144 inches long.

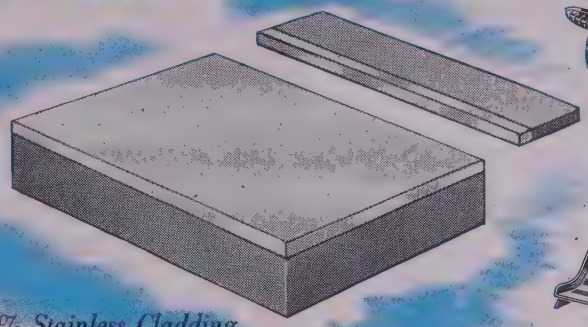
eck No. 13 on Reply Card for more Details

OR SPOT CHECKING: Fabricated astic or nonferrous metal parts n be rapidly tested with the Im-essor, a new hardness tester of-red by Barber-Colman Co., Rock-rd, Ill. Suitable for spot checking, can be used in any position.

eck No. 14 on Reply Card for more Details

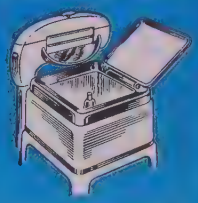
ESISTORS FOR LOW WATTAGE: ulletin 35 Edgeohm high current re-tors, made by Ward Leonard Elec-

HOW TO MAKE GOOD PRODUCTS BETTER AT NO EXTRA COST . . .

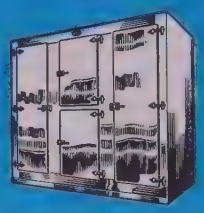


20% Stainless Cladding

with PERMACLAD
STAINLESS CLAD STEEL



Truly corrosion resistant!
Easily formed or deep drawn!



Wherever you use PERMACLAD, products take on new gleaming beauty and corrosion resistance. And costs go down!

Reason: PERMACLAD combines the surface characteristics of stainless steel and the easy forming qualities of mild carbon steel. You can cold-form PERMACLAD with ease—subject it to deeper draws—form it into products impossible with certain other corrosion resistant materials! Percentage of stainless steel inseparably welded to mild steel backing is usually 10% or 20% but this can be increased or decreased to suit your requirements. Permaclad is as modern as your newest designs—as versatile as you want it to be.

All sorts of products, from chemical vessels and vats to children's sliding boards, are now being made from PERMACLAD. For better products at lower costs, get full details today. Write for free folder P-18.

Alan Wood Steel Company, Conshohocken, Penna.

The Finer The Finish The Finer The Product For The Finest Finish Use PERMACLAD

PERMACLAD
STAINLESS CLAD STEEL

A Product of ALAN WOOD STEEL COMPANY
CONSHOHOCKEN, PENNA.

AW Algrip, Abrasive Floor Plate • AW Super-Diamond Floor Plate • Billets • Plates • Sheets (Alloy and Special Grades)

tric Co., Mount Vernon, N. Y., are now available in four shorter lengths —6, 9¼, 12½ and 15¾ inches— which permit their use in lower wattage applications. Minimum resistance value per unit is extended from 0.35 to 0.05 ohms. Continuous current capacities range from 21 to 79 amp for all sizes.

Check No. 15 on Reply Card for more Details

APPLIED BY BRUSH OR SPRAY: Brooklyn Varnish Mfg. Co., Brooklyn 1, N. Y., announces Tuf-On Speedtuf varnish, made with phenolic resins and tung oil. It meets all requirements of a finish for vulcanized fiber. It may be applied by brush or spray and dries in an hour to a lustrous coating.

Check No. 16 on Reply Card for more Details

FOR PATCHING FLOORS: A new plastic type floor material, designated as Swift-Floor, is offered by Monroe Co., Inc., Cleveland 6, O. It can be used for patching wood or concrete floors or for complete resurfacing. It is set by compression and floor can be used 1 minute after application.

Check No. 17 on Reply Card for more Details

PROVIDE VENTILATING AND COOLING AIR: Portable ventilators, introduced by Mine Safety Appliances Co., Pittsburgh 8, Pa., are equipped with high velocity fans powered by either gasoline or electricity and provide both ventilating and cooling air.

Check No. 18 on Reply Card for more Details

PREVENTS LOAD SHIFTING: Sage Equipment Co., Buffalo 13, N. Y., announces a new automatic gluer in 12, 14 and 18-inch widths. Guard rails and two glue wheels are completely adjustable.

Check No. 19 on Reply Card for more Details

VISIBLE OIL GAGE: Combination oil cups and oil gages, offered by Trico Fuse Mfg. Co., Milwaukee 12, Wis., can be used as a visible oil cup to replenish oil in bearings, transmission and crankshaft cases, etc., and also as an oil gage to check oil levels periodically. Available in 1, 2, 4 and 8-ounce capacities.

Check No. 20 on Reply Card for more Details

PROPORTIONING TYPE VALVE: An atomizing valve for use on deaerating heaters, vacuum deaerators and hot process softeners is announced by Belco Industrial Equipment Division Inc., Paterson 3, N. J. It is a proportioning type, insuring uniform atomization under all varying load conditions. It is nonclogging and designed to provide a tangential spraying action and atomization of incoming water to droplet form. Available in all capacity ranges up to 2000 gallons per minute.

Check No. 21 on Reply Card for more Details

FOR FAST HANDLING: Designed for intraplant shipment of semi-processed and finished parts are the pallet boxes made by Fab-Weld Corp., Philadelphia 34, Pa. Designated as Return-O-Tainer, they have positive locking, hinged sides that fold flat for return or storage. Boxes are all steel, completely welded.

Check No. 22 on Reply Card for more Details

REMOVES DRAWING COMPOUNDS: Development of Chemclean No. 133, a new di-phase cleaner, is announced by Chemclean Products Corp., New York 13, N. Y. It removes buffing and drawing compounds, oils, greases, etc., and eliminates all hand operations. It can be used in conjunction with a vapor degreaser.

Check No. 23 on Reply Card for more Details

ELIMINATES WASTE PACKING: For lubricating journals on overhead cranes and similar equipment, Miller Felpax Corp., Winona, Minn., offers a new lubricator that eliminates waste packing. It consists of nonglazing felt wicks attached to a holder which keeps the wicks in place with correct pressure against the axle to provide full and constant lubrication to bearings and thrust flanges at all times.

Check No. 24 on Reply Card for more Details

INCREASE WEAR LIFE: Newly developed Colmonoy centerless grinder work rest blade tips increase wear life and reduce breakage on centerless grinder applications. Colmonoy tips can be silver soldered to blades now in use. Available from Diamonds & Tools Inc., Detroit 3, Mich.

Check No. 25 on Reply Card for more Details

MAKES POSITIVE COPY: Known as Kodagraph Autopositive film, a new direct-positive film for making reproductions of engineering and architectural drawings and maps has been developed by Eastman Kodak Co., Rochester 4, N. Y. Film may be handled in normal room light and produces a positive copy directly from a positive original drawing, without a negative step. Film is available in 30 and 100 foot rolls in 24, 30, 36, 42 and 44-inch widths.

Check No. 26 on Reply Card for more Details

ALL-PURPOSE COOLANT BASE: Safco 770 compound, developed by Swan-Finch Oil Corp., New York 20, N. Y., has the consistency of a liquid paste and combines in a single water-soluble product all essential qualiti of a grinding compound and sulphu ized cutting oil. In grinding oper tions it will prevent wheel-loadin reduce wheel dressings, keep wo from rusting. In machining, it h same fine lubricating and antiwe properties of sulphurized oils.

Check No. 27 on Reply Card for more Deta

SHELVING ACCESSORIES: Gener Fireproofing Co., Youngstown, O., i troduces new shelving accessorie Among these are: Pipe bracke made of 3/16 x 7/8-inch bar, will tak ½-inch standard pipe; sloped box for storage of small parts; snap-o label holders made to take labe 1 3/16 inches high by 3½ inches lon bumper posts; gusset sway braces.

Check No. 28 on Reply Card for more Deta

FORMS LEAK-PROOF SEAL: Fo use on lines conveying both liqui and gases and where pressures a temperatures do not exceed 3000 p and 225° F, is the ball bearing swiv joint made by Chiksan Co., Bre Calif. The packing unit, which compounded from Hycar rubber, product of B. F. Goodrich Chemic Co., forms a leak-proof seal betwe metal parts.

Check No. 29 on Reply Card for more Deta

MECHANICAL GRABBING FIN GERS: Yale & Towne Mfg. Co., Phi adelphia, Pa., announces a Worksav development which equips tilting for models of the battery-powered han truck line with hydraulically operate fingers which grasp and pick u drums, cylindrical cardboard contain ers and kegs without the use of pa lets or skids.

Check No. 30 on Reply Card for more Deta

HANDLES AIR, WATER, OILS Model 1044 valve, made by Crescen Valve Co., Huntington Park, Calif may be operated continuously at an cycling speed up to 600 cycles p minute. This four-way, pilot ope ated, solenoid controlled valve wi handle air, water and light oils. is available in two types: One f operation on line pressures from to 50 psi; the other for operation c line pressures from 30 to 150 psi.

Check No. 31 on Reply Card for more Deta

FOR MORE INFORMATIO
on the new products and equipmen in this section, fill in a card It will receive prompt attentio

Helpful Literature

Centrifuges
...arples Corp.—24-page illustrated ...tin No. 1248 presents operating ...ils, specifications and application ... for line of laboratory and port... Super-Centrifuges available in ..., Presurtite and Vaportite de... Also described are Vaporseal ...fier for varnishes, lacquers and ...nels and EnBloc purifiers.

Nonslip Floor Plate
...an Wood Steel Co.—8-page il...ated booklet form No. 3356 pre...s information on A. W. Algrip ...d steel floor plate in which abra... grain is rolled as integral part ...pper portion. Plate retains non... properties under dry and wet ...itions and even on steep inclines.

Engineering Service
...ntinental Industrial Engineers, ...—12-page illustrated booklet No. ... covers consultation and design ...ice in manufacturing, engineering ... construction of complete indus... plants, production lines, special ...matic machines and heat proc...ng equipment.

Air Dump Cars
...agor Car Corp.—4-page illus...d folder "For Only $1.35 a Day" ...ains economies of automatic air ...p car operation. These heavy-... cars have open type body for ...e volume capacity and low height ...cilitate loading.

Unit Heaters
...ack, Sivalls & Bryson, Inc.—36-... illustrated catalog No. 54, part ...ection 3 covers fluid jacket, vol... type and internal firebox heaters. ...er each type are listed how it is ..., capacities and specifications, ...ures and how it works.

Welding Electrodes
...ampion Rivet Co.—32-page illus...d catalog No. 49A contains data ...ull line of welding electrodes in...ng types for mild steel, low-al...high-tensile strength steels, stain... steel, hard surfacing, tool and ... cast iron, bronze and aluminum ...ell as copper alloy and gas weld...rods.

Sanding Wheel
...ybestos-Manhattan, Inc., Man...an Rubber Div.—Bulletin No. ...-A deals with Manhattan Moldisc ...ed disk wheel for rotary sanders. ...as fast free-cutting qualities for ...hing stainless steel and other ...s which must be ground with...generating excessive heat.

Fire Fighting Equipment
...Insul Chemical Co.—20-page il...ated catalog depicts improved ...nl model B dry chemical hand ...guishers, piped systems, large ...onary units, fire trucks, trailers ...other fire fighting equipment.

80. Press Brake Dies
Verson Allsteel Press Co.—88-page illustrated bulletin DM-48 is handbook of press brake dies, punching attachments and press brakes. Variety of metal forming tools and methods are described and full specifications given.

81. Drop Hammer
Chambersburg Engineering Co.—12-page illustrated bulletin No. 11-L-9 presents information on Ceco-Drop piston-lift gravity hammer and lists design features and improvements. Hammers listed range from 500 to 5000 lb in size.

82. Welding of Stainless Steel
Republic Steel Corp.—24-page illustrated booklet "Welding of Republic Enduro Stainless Steel" describes in detail welding methods used for various grades of Republic Enduro stainless steel.

83. Steel Castings
Steel Founders' Society of America—4-page illustrated product design study No. 12 explains how weight and cost of poppet valve gear box were reduced through use of cast steel. Other typical steel castings are depicted and advantages listed.

84. Steel Cleaner
Enthone, Inc.—2-page bulletin on Cleaner 100 discusses alkaline cleaner for either soak or electrolytic cleaning of steel. It has high detergent action which makes it effective for soak cleaning. It is usable in both hard and soft water where it is free-rinsing and does not form stable foams.

85. Oil-Immersed Starter
Allis Chalmers Mfg. Co.—4-page illustrated bulletin No. 14B7274 discusses oil-immersed, full-voltage type 371 wall-mounted starter for control of squirrel-cage motors and primary of wound rotor motors of 350 hp or less at 2300 v. Completely sealed and weatherproof, it can be used for outdoor installations and in hazardous locations.

86. Grooved Wheel Casters
Bassick Co. — 8-page illustrated folder CW-49 gives information on V-grooved wheel casters for use on angle iron track and which feature mobility, high load capacity, simple installation, flexibility, controlled movement and self-cleaning. Typical installations are depicted and specifications and applications detailed.

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87. Hydraulic Oils

Hydraulic Equipment Co.—2-page bulletin SO 10849 gives representative list of products of principal oil companies, together with technical data on their hydraulic oils that have been approved for Hydreco oil-hydraulic systems. Folder also contains general facts about oils and their use in hydraulic systems.

88. Induction Heating Unit

Lindberg Engineering Co.—2-page illustrated bulletin T-1430 describes LI-10 induction heating unit. It is heavy-duty vacuum tube converter designed for continuous duty and capable of supplying 10 kw at 450,000 cycles per second. Presented also are design features, applications, operating requirements and engineering data.

89. Nonferrous Alloys

Riverside Metal Co.—44-page illustrated pocket-size "Riverside Handbook" on nonferrous metals is guide on how to order and specify various alloys. Listed are applications, composition, forms, properties and manufacturing limits of phosphor bronze, nickel silver, cupro nickel and beryllium copper as well as special alloys. Special section deals with heat treatment of beryllium copper.

90. Blast Cleaning

American Wheelabrator & Equipment Co.—4-page illustrated bulletin No. 654 on 15-in. continuous Wheelabrator Tumblast explains combination of tumbling and longitudinal travel of work in this airless blast cleaning machine. Applications for this unit include cleaning small parts such as bearing retainers, coil springs and pipe fittings.

91. Metal Baskets

Buffalo Wire Works Co.—6-page illustrated folder form No. 595 shows typical examples of metal baskets which are representative of limitless shapes, designs and types of construction which can be produced to order. Materials available in square or diamond mesh wire cloth, ordinary wire and flat expanded metal are listed.

92. Lift Truck

Hyster Co. — 16-page illustrated booklet F-1055B is devoted to model 20 gas powered pneumatic-tired industrial lift truck that has 2000-lb capacity. It lifts, transports, stacks and tiers, and operates over any kind of surface indoors or outdoors. Various components are shown and dimensions, lifting heights, loads and turning radius listed.

93. Hydraulic Radial Drills

Fosdick Machine Tool Co.—28-p illustrated catalog No. 36 descri in detail Economax hydraulic ra drills built in sizes from 3 to 8 Having 36 spindle speeds, drill f tures locking control, tool ejec fluorescent light and hardened s ways.

94. Well Pumping Control

Cutler-Hammer, Inc. — Bull 9589D-21 describes oil well pump control designed for across-the-l starting of squirrel-cage mot Geared to oil well capacity or op ating schedule, program time swi automatically controls timing cy of pumping unit.

95. Variable Speed Motors

U. S. Electrical Motors, Inc.— page illustrated form 1515 shows h Varidrive motors provide any sp from 1 to 10,000 rpm to meet ex ting operating conditions. Vari components of motor are shown their design explained as well methods used to produce entire u

96. Hydraulic Valves

R-S Products Corp.—12-page ill trated catalog No. 18 introduces n line of 50-lb narrow face-to-f valves designed particularly for draulic service. Described also controls, stuffing boxes of vari types and advantages of these val compared with conventional types

97. Inclinable Presses

Federal Machine & Welder Co.— page illustrated bulletin OBI prese information on open back inclina presses. Single geared model ran from 40 to 200 tons in capacity flywheel type from 40 to 75 tons, length of stroke can be supplied meet requirements.

98. Industrial Markers

American Crayon Co.—16-page-ill trated brochure AD620-44950 is ind trial crayon guide for permane semipermanent or temporary ma ing of all kinds of surfaces. Ty are depicted for use on wide ra from hot, cold, slick or oily me to glass and glazed surfaces.

99. Wire Products

John A. Roebling's Sons Co.— page illustrated booklet "Roebl Wire Products" presents informat on wire rope, fittings, strands, w rope and grommet slings, screen and flat and shaped wires. Also cussed are applications, installat maintenance and use of wire r

100. Accounting Machine

International Business Machi Corp.—6-page illustrated folder 52-5303-3 describes accounting chine that prints three lines f one punched tabulating card. It cumulates data at speeds of 80 150 cards a minute and prints speeds of 80 or 100 lines a min

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9	29	49	69	89
10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
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Market Summary

BRISK steel market through first half of 1950 is in prospect. Some products will be in short supply the next three to four months, principally sheets and strip, giving rise to some conversion and gray market business. Higher prices loom, one medium sized producer last week raising prices $5 per ton on hot-rolled strip and semifinished steel. Supply conditions are expected to be more acute in the Midwest than elsewhere. But a note of caution prevails in metalworking circles. New buying is leveling off; only in flat-rolled items is a strong surge continuing. Steelmakers are concerned over demand prospects in the heavy industries, but view the automotive outlook as promising. However, some uncertainty prevails here too and developments are being watched closely. Many auto shops are closing for steel inventory replenishment. In a number of other lines, notably farm implements, operations are curtailed, pending rebuilding of steel stocks.

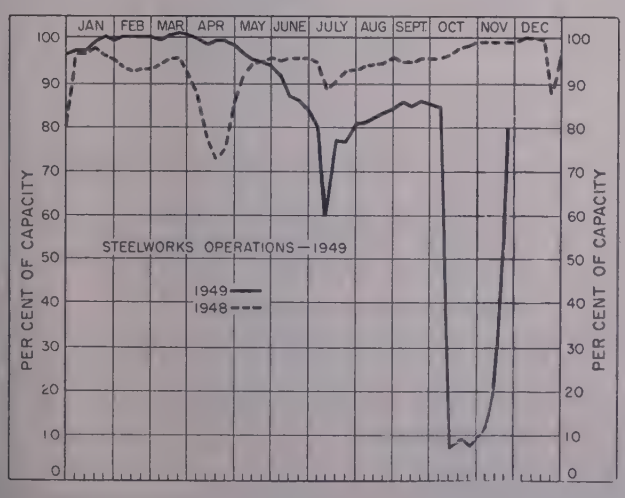
PRODUCTION—Steelmaking operations are recovering rapidly from the strike suspension. Last week the national ingot rate rose another 24 points to 80 per cent of capacity. The prestrike rate of 85 per cent is expected to be topped before this weekend.

SUPPLY—Steelmakers are under pressure for shipments from all directions. Fabricators and warehouses are seeking to replenish stocks as quickly as possible. Expectations are that supply will begin to catch up with demand in most products in a few weeks, possibly before year-end. In flat-rolled, outstanding exception in this regard, it will be late first quarter at earliest before any easing in pressure is likely. Most sheet sellers are sold out through first quarter, and several through first half. Most products are expected to be in progressively easier supply as the finishing mills regain prestrike operating levels and mill shipments resume normal pace. Last week Midwest shipments were interfered with slightly by a truck haulers' strike.

DEMAND—New buying is noticeably slower. Plate producers are reaching into distant areas for orders, absorbing freight where necessary. Most sellers can give deliveries in three to five weeks. Carbon bar sales are leveling off as the flow of tonnage from the mills mounts. Mill shipments on bars average four to five weeks. Forging manufacturers, cold-finishers and the warehouses are specifying actively. There is less all-around pressure evident.

PRICES— Market attention will be riveted on price developments from here on. One medium sized Pittsburgh district producer advanced prices $5 per ton on hot-rolled strip and semifinished steel. This is interpreted as showing the way the wind is blowing, but it is not believed any general advance will come before first quarter. Consumers indicate they will resist increases. Producers' policy will likely depend on competitive conditions and business prospects. Meanwhile, some high-priced conversion steel has been placed but consumers generally are expected to move slowly in entering this market. In some quarters the thought is expressed that conversion steel buyers may have acted too hastily in ordering. Gray market offerings are appearing above warehouse price levels but the volume of business going is not imposing. Significantly, some of the zip appears to have gone from the scrap market.

COMPOSITES—STEEL's weighted index of finished steel prices held unchanged last week at 152.52 and compared with 151.86 a year ago. The arithmetical composite held steady at $91.64. Scrap was slightly easier in some districts, the price composite on steelmaking grades declining to $29.83 from $30. Composites on pig iron follow: No. 2 foundry iron, $46.10; malleable, $47.27; and basic, $45.60.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Nov. 26	Change	Same Week 1948	Same Week 1947
Pittsburgh	73	+30	96.5	102
Chicago	75	+30*	98.5	95
Eastern Pa.	80	+ 0.5	95	93.5
Youngstown	90	+40	105	100
Wheeling	99	+21	95.5	86
Cleveland	90.5	+17.5*	96.5	93.5
Buffalo	101	None	104	88.5
Birmingham	62	+37	100	103
New England	87	+14	90	87
Cincinnati	60	+ 4	103	87
St. Louis	87	— 4.5	84.5	78
Detroit	101	+22	99	92
Western	71	+13	..	..
Estimated national rate	80	+24	99	96.5

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. *Change from revised rate.

Composite Market Averages

	Nov. 23 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	152.52	152.52	152.52	151.86	99.16
Index in cents per lb ..	4.132	4.132	4.132	4.114	2.686
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$91.64	$91.64	$91.64	$95.50	$56.73
No. 2 Fdry Pig Iron, GT	46.10	46.10	46.10	46.69	23.67
Malleable Pig Iron, GT..	47.27	47.27	47.27	47.41	24.29
Basic Pig Iron, GT.....	45.60	45.60	45.60	46.29	23.00
Steelmaking Scrap, GT..	29.83	30.00	26.67	43.25	16.83

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Nov. 23 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh ...	3.35	3.35	3.35	3.35–55	2.15
Bars, H.R., del. Phila. ...	3.83	3.83	3.83	3.79	2.47
Bars, H.R., Chicago	3.35	3.35	3.35	3.35	2.15
Bars, C. F., Pittsburgh ...	3.95-4.00	3.95-4.00	3.95-4.00	3.95-4.25	2.65
Bars, C. F., Chicago	4.00	4.00	4.00	4.00	2.65
Shapes, Std., Pittsburgh ..	3.25	3.25	3.25	3.25–30	2.10
Shapes, Std., Chicago	3.25	3.25	3.25	3.25	2.10
Shapes, del. Phila.	3.50	3.50	3.50	3.48	2.215
Plates, Pittsburgh	3.40	3.40	3.40	3.40–60	2.10
Plates, Chicago	3.40	3.40	3.40	3.40	2.10
Plates, Coatesville, Pa. ..	3.50	3.50	3.50	3.75	2.10
Plates, Sparrows Point, Md.	3.40	3.40	3.40	3.45	2.10
Plates, Claymont, Del.	3.50	3.50	3.50	3.95	2.10
Plates, del. Phila.	3.59	3.59	3.59	3.71	2.15
Sheets, H.R., Pittsburgh ..	3.25	3.25	3.25	3.25–30	2.10
Sheets, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Sheets, C.R., Pittsburgh ..	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Chicago	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Detroit	4.20	4.20	4.20	4.20	3.15
Sheets, Galv., Pittsburgh ..	4.40	4.40	4.40	4.40	3.50
Strip, H.R., Pittsburgh ...	3.25	3.25	3.25	3.25–70	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25–30	2.10
Strip, C.R., Pittsburgh...	4.00	4.00	4.00	4.00–75	2.80
Strip, C.R., Chicago	4.00–15	4.00–15	4.00–15	4.00–25	2.90
Strip, C.R., Detroit	4.20–25	4.20–25	4.20–25	4.20–50	2.90
Wire, Basic, Pittsburgh ...	4.15	4.15	4.15	4.15-4.50	2.60
Nails, Wire, Pittsburgh ...	5.15	5.15	5.15	5.15-6.30	2.55
Tin plate, box, Pittsburgh.	$7.75	$7.75	$7.75	$6.70	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$61.00	$61.00	$61.00	$61.00	$40.00
Sheet bar, mill (NT)	51.78–57.00	51.78–52.00	51.78–52.00	67.00	34.00
Wire rods, ⅞-⅜", Pitts. ..	3.40	3.40	3.40	3.40-4.15	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$24.50
Basic, Valley	46.00	46.00	46.00	46.00	23.50
Basic, del. Phila.	49.44	49.44	49.44	50.17	25.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	46.00-46.50	24.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	50.67	25.84
No. 2 Fdry, Birmingham ..	39.38	39.38	39.38	43.38	20.38
No. 2 Fdry. (Birm.) del Cin.	46.08	46.08	46.08	49.09	24.06
Malleable, Valley	46.50	46.50	46.50	46.50	24.00
Malleable, Chicago	46.50	46.50	46.50	46.50	24.00
Charcoal, Lyles, Tenn.	60.00	60.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	163.00	135.00*

* Delivered, duty paid.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts. ..	$33.50	$33.00	$29.00	$42.75	$18.50
No. 1 Heavy Melt. E. Pa. .	26.50	26.50	24.00	45.25	15.50
No. 1 Heavy Melt. Chicago.	29.50	30.50	27.50	41.75	16.50
No. 1 Heavy Melt. Valley..	32.75	32.75	29.25	42.75	17.25
No. 1 Heavy Melt. Cleve...	30.25	30.25	25.75	42.25	15.25
No. 1 Heavy Melt. Buffalo.	29.75	29.75	27.25	48.50	17.00
Rails, Rerolling, Chicago..	44.50	44.50	41.50	70.50	22.25
No. 1 Cast, Chicago	42.50	42.50	41.50	70.50	20.00

COKE, Gross Ton

Beehive, Furn., Connlsvl.	$13.25	$13.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl. .	15.75	15.75	15.75	17.00	7.75
Oven Fdry, Chicago	20.00	20.00	20.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	18.50	18.50	17.625	23.50	12.00
Zinc, E. St. Louis	9.75	9.75	9.25	17.50	8.25
Lead, St. Louis	11.80	12.30	12.80	21.30–35	6.35
Tin, New York.....	85.00	92.00	95.75	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	17.00	15.00
Antimony, Laredo, Tex. ..	32.00	32.00	38.50	38.50	14.50
Nickel, refinery, duty paid.	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark, del.	50.63	51.13	51.63	52.13
Brooklyn, N.Y., del.	....	52.79	53.29	....
Birmingham District				
Birmingham, Ala. R2, S9	38.88	39.38	....	....
Woodward, Ala. W15	38.88	39.38	....	....
Cincinnati, del.	....	46.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda, N.Y. W12	46.00	46.50	47.00	....
N. Tonawanda, N.Y. T9	....	46.50	47.00	....
Boston, del.	55.26	55.76	56.20	....
Rochester, N.Y., del.	48.63	49.13	49.63	....
Syracuse, N.Y., del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary, Ind. C3	46.00	....	46.50	....
Indiana Harbor, Ind. I-2	46.00	....	46.50	....
So. Chicago, Ill. W14	46.00	46.50	46.50	....
So. Chicago, Ill. C3	46.00	....	46.50	47.00
So. Chicago, Ill. Y1	46.00	46.50	46.50	....
Milwaukee, del.	47.89	48.39	48.39	48.89
Muskegon, Mich, del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Lorain, O. N3	46.00	....	....	47.00
Duluth I-3	....	....	46.50	....
Erie, Pa. I-3	46.00	46.50	46.50	47.00
Everett, Mass. E1	....	50.50	51.00	....
Geneva, Utah G1	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.20	....	....
Portland, Oreg., del.	....	54.20	....	....
Los Angeles, San Francisco, del.	53.70	54.20	....	....
Granite City, Ill. M10	47.90	48.40	48.90	....
St. Louis, del. (incl. tax)	48.65	49.15	49.65	....
Ironton, Utah C11	46.00	46.50	....	....
Minnequa, Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
Neville Island, Pa. P6	46.00	46.50	46.50	47.00
Pitts. N.&S. sides, Ambridge, Aliquippa, del.	47.19	47.69	47.69	48.19
McKees Rocks, del.	46.95	47.45	47.45	47.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	47.44	47.94	47.94	48.44
Verona, del.	47.90	48.40	48.40	48.90
Brackenridge, del.	48.13	48.63	48.63	49.13
Bessemer, Pa. C3	46.00	....	46.50	47.00
Clairton, Rankin, So. Duquesne, Pa. C3	46.00	....	....	....
McKeesport, Pa. N3	46.00	....	....	47.00
Sharpsville, Pa. S6	46.00	46.50	46.50	47.00
Steelton, Pa. B2	48.00	48.50	49.00	49.50
Steubenville, O. W10	46.00	....	....	....
Struthers, O. S16	46.00	....	....	....
Swedeland, Pa. A3	48.00	48.50	49.00	49.50
Philadelphia, del.	49.44	49.94	50.44	50.94
Toledo, O. I-3	46.00	46.50	46.50	47.00
Cincinnati, del.	51.01	51.51	....	....
Troy, N.Y. R2	48.00	48.50	49.00	....
Youngstown District				
Hubbard, O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.26	50.76	50.76	51.26

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75 2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and ove

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton an each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; Add $1 for each 0.5% Si to 11.50%)

Jackson, O. J1, G2	$59.50
Buffalo H1	60.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 fo each 0.5% Mn over 1%; $1 for 0.045% max. P)

Niagara Falls, N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry., 12½ lb, piglets, frt. allowed K2..	82.00
Wenatchee, Wash, OH & Fdry, frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$60.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton, Pa. B2	54.00
Philadelphia delivered	57.09
Troy, N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL Nov. 23, 1949; cents per pound unless otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

…TS, Carbon, Forging (NT)

…oit R7 ..... $50.00
…hall,Pa. C3 ..... 50.00

…TS, Alloy (NT)

…oit R7 ..... $51.00
…nton,Tex. S5 ..... 59.00
…and,Pa. C18 ..... 51.00
…hall,Pa. C3 ..... 51.00
…uquesne,Pa. C3 ..... 51.00

…TS, BLOOMS & SLABS Carbon, Rerolling (NT)

…emer,Pa. C3 ..... $52.00
…rton,Pa. C3 ..... 52.00
…hohocken,Pa. A3 ..... 57.00
…ey,Ala. T2 ..... 52.00
…field,Ala. T2 ..... 52.00
…ana,Calif. K1 ..... 71.00
…,Ind. C3 ..... 52.00
…stown,Pa. B2 ..... 52.00
…awanna,N.Y. B2 ..... 52.00
…hall,Pa. C3 ..... 52.00
…on,Pa. S3 ..... 57.00
…hicago,Ill. C3 ..... 52.00
…uquesne,Pa. C3 ..... 52.00

Carbon, Forging (NT)

…emer,Pa. C3 ..... $61.00
…alo R2 ..... 61.00
…on,O. R2 ..... 61.00
…rton,Pa. C3 ..... 61.00
…eland R2 ..... 61.00
…hohocken,Pa. A3 ..... 63.00
…oit R7 ..... 61.00
…ey,Ala. T2 ..... 61.00
…field,Ala. T2 ..... 61.00
…ana,Calif. K1 ..... 80.00
…,Ind. C3 ..... 61.00
…va,Utah G1 ..... 61.00
…ston,Tex. S5 ..... 69.00
…Harbor,Ind. I-2 ..... 61.00
…stown,Pa. B2 ..... 61.00
…awanna,N.Y. B2 ..... 61.00
…hall,Pa. C3 ..... 61.00
…uquesne,Pa. C3 ..... 61.00
…icago,Ill. C3, R2.. 61.00
…ren,O. C17 ..... 61.00

Alloy (NT)

…lehem,Pa. B2 ..... $63.00
…alo R2 ..... 63.00
…on,O. R2, T7..... 63.00
…hohocken,Pa. A3 .. 65.00
…oit R7 ..... 63.00
…ana,Calif. K1 ..... 82.00
…,Ind. C3 ..... 63.00
…ston,Tex. S5 ..... 71.00
…stown,Pa. B2 ..... 63.00
…awanna,N.Y. B2 .. 63.00
…illon,O. R2 ..... 63.00
…and,Pa. C18 ..... 63.00
…hall,Pa. C3 ..... 63.00
…on,Pa. S3 ..... 63.00
…icago,Ill. C3, R2.. 63.00
…uquesne,Pa. C3 .. 63.00
…en,O. C17 ..... 63.00

…T BARS (NT)

…field,O. E6..(GT) $58.00
…mouth,O. P12 ..... 52.00
…on,Pa. S3 ..... 57.00

…IDS, SEAMLESS TUBE (NT)

…on,O. R2 ..... $76.00
…eland R2 ..... 76.00
…Harbor,Ind. I-2 .... 76.00
…illon,O. R2 ..... 76.00
…icago,Ill. R2 ..... 76.00

…

…ippa,Pa. J5 ..... 3.25
…uall,Pa. C3 ..... 3.25
…en,O. R2 ..... 3.25
…gstown C3, R2 .... 3.25

… RODS

…maCity,Ala. R2 .. 3.40
…lo W12 ..... 3.40
…eland A7 ..... 3.40
…ra,Pa. A7 ..... 3.40
…eld,Ala. T2 ..... 3.40
…ton,Tex. S5 ..... 3.95
…dfarbor,Ind. Y1 .... 3.40
…ttown,Pa. B2 ..... 3.40
…,Ill. A7 ..... 3.40
…ngeles B3 ..... 4.20
…assen,Pa. P7 ..... 3.40
…bourg,Calif. C11 .... 4.05
…mouth,O. P12 ..... 3.40
…icago,Ill. R2 ..... 3.40
…wsPoint B2 ..... 3.50
…ng,Ill.(1) N15 ..... 3.40
…hers,O. Y1 ..... 3.40
…ince,Calif. C11 .... 4.20
…ester,Mass. A7 .... 3.70

STRUCTURALS

Wide Flange

Bethlehem,Pa. B2 ..... 3.30
Lackawanna,N.Y. B2 .. 3.30
Munhall,Pa. C3 ..... 3.20
So.Chicago,Ill. C3 ..... 3.20

H.-S. Low-Alloy

Aliquippa,Pa. J5 ..... 4.95
Bessemer,Ala. T2 ..... 4.95
Bethlehem,Pa.(14) B2 .. 5.05
Clairton,Pa. C3 ..... 4.95
Fairfield,Ala. T2 ..... 4.95
Fontana,Calif. K1 ..... 6.10
Gary,Ind. C3 ..... 4.95
Ind.Harbor,Ind. I-2, Y1. 4.95
Johnstown,Pa. B2 ..... 5.05
Lackawna,N.Y.(14) B2 .. 5.05
Munhall,Pa.(14) C3 .... 4.95
So.Chicago,Ill.(14) C3 .. 4.95
Struthers,O. Y1 ..... 4.95

Carbon Steel Stand. Shapes

Aliquippa,Pa. J5 ..... 3.25
Bessemer,Ala. T2 ..... 3.25
Bethlehem,Pa. B2 ..... 3.30
Clairton,Pa. C3 ..... 3.25
Fairfield,Ala. T2 ..... 3.25
Fontana,Calif. K1 ..... 3.80
Gary,Ind. C3 ..... 3.25
Geneva,Utah G1 ..... 3.25
Houston,Tex. S5 ..... 3.65
Ind.Harbor,Ind. I-2 .... 3.25
Johnstown,Pa. B2 ..... 3.30
KansasCity,Mo. S5 .... 3.85
Lackawanna,N.Y. B2 .. 3.30
LosAngeles B3 ..... 3.85
Minnequa,Colo. C10 .... 3.75
Munhall,Pa. C3 ..... 3.25
Niles,Calif.(22) P1 .... 3.97
Portland,Oreg. O4 ..... 3.90
Seattle B3 ..... 3.90
So.Chicago,Ill. C3, W14 .3.25
So.SanFrancisco B3 .... 3.80
Torrance,Calif. C11 .... 3.85
Weirton,W.Va. W6 ..... 3.25

Alloy Stand. Shapes

Clairton,Pa. C3 ..... 4.05
Fontana,Calif. K1 ..... 5.25
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 ..... 4.05

SHEET STEEL PILING

Ind.Harbor,Ind. I-2 .... 4.05
Lackawanna,N.Y. B2 ... 4.05
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 ..... 4.05
Weirton,W.Va. W6 ..... 4.05

PLATES, Carbon Steel

AlabamaCity,Ala. R2 .. 3.40
Aliquippa,Pa. J5 ..... 3.40
Ashland,Ky.(15) A10 .... 3.40
Bessemer,Ala. T2 ..... 3.40
Clairton,Pa. C3 ..... 3.40
Claymont,Del. W16 .... 3.50
Cleveland J5, R2 ..... 3.40
Coatesville,Pa. L7 ..... 3.50
Conshohocken,Pa. A3 ... 3.50
Ecorse,Mich. G5 ..... 3.65
Fairfield,Ala. T2 ..... 3.40
Fontana,Calif. K1 ..... 4.00
Gary,Ind. C3 ..... 3.40
Geneva,Utah G1 ..... 3.40
Harrisburg,Pa. C5 ..... 3.75
Houston,Tex. S5 ..... 3.80
Ind.Harbor,Ind. I-2, Y1. 3.40
Johnstown,Pa. B2 ..... 3.40
Lackawanna,N.Y. B2 .. 3.40
Minnequa,Colo. C10 .... 4.30
Munhall,Pa. C3 ..... 3.40
Pittsburgh J5 ..... 3.40
Seattle B3 ..... 4.30
Sharon,Pa. S3 ..... 3.40
So.Chicago,Ill. C3, W14 .3.40
SparrowsPoint,Md. B2 .. 3.40
Steubenville,O. W10 .... 3.40
Warren,O. R2 ..... 3.40
Weirton,W.Va. W6 ..... 3.40
Youngstown C3, Y1 .... 3.40

PLATES (Universal Mill)

Fontana,Calif. K1 ..... 4.30

PLATES, Open-Hearth Alloy

Coatesville,Pa. L7 ..... 4.50
Conshohocken,Pa. A3 .. 4.40
Fontana,Calif. K1 ..... 5.40
Gary,Ind. C3 ..... 4.40
Johnstown,Pa. B2 ..... 4.40
Munhall,Pa. C3 ..... 4.40
Sharon,Pa. S3 ..... 4.40
So.Chicago,Ill. C3 ..... 4.40
SparrowsPoint,Md. B2 .. 4.40

PLATES, Ingot Iron

Ashland,cl(15) A10 .... 3.65
Ashland,lcl(15) A10 .... 4.15
Cleveland,cl R2 ..... 3.65
Warren,O.,cl R2 ..... 3.65

PLATES, Wrought Iron

Economy,Pa. B14 ..... 7.85

PLATES,High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 5.20
Bessemer,Ala. T2 ..... 5.20
Clairton,Pa. C3 ..... 5.20
Cleveland J5, R2 ..... 5.20
Conshohocken,Pa. A3 .. 5.20
Ecorse,Mich. G5 ..... 5.45
Fairfield,Ala. T2 ..... 5.20
Fontana,Calif. K1 ..... 5.80
Gary,Ind. C3 ..... 5.20
Geneva,Utah G1 ..... 5.20
Houston,Tex. S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1. 5.20
Johnstown,Pa. B2 ..... 5.20
Munhall,Pa. C3 ..... 5.20
Pittsburgh J5 ..... 5.20
Sharon,Pa. S3 ..... 5.65
So.Chicago,Ill. C3 ..... 5.20
SparrowsPoint,Md. B2 .. 5.20
Warren,O. R2 ..... 5.20
Youngstown Y1 ..... 5.20

FLOOR PLATES

Cleveland J5 ..... 4.55
Conshohocken,Pa. A3 ... 4.55
Harrisburg,Pa. C5 ..... 4.55
Ind.Harbor,Ind. I-2 .... 4.55
Munhall,Pa. C3 ..... 4.55
So.Chicago,Ill. C3 ..... 4.55

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2 ... 3.35
Aliquippa,Pa. J5 ..... 3.35
Alton,Ill.(1) L1 ..... 3.35
Ashland,Ky. (17) A10 .. 3.35
Atlanta,Ga. A11 ..... 3.50
Bessemer,Ala. T2 ..... 3.35
Buffalo R2 ..... 3.35
Canton,O. R2 ..... 3.35
Clairton,Pa. C3 ..... 3.35
Cleveland R2 ..... 3.35
Ecorse,Mich. G5 ..... 3.55
Emeryville,Calif. J7 .... 4.10
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 ..... 4.00
Gary,Ind. C3 ..... 3.35
Houston,Tex. S5 ..... 3.75
Ind.Harbor,Ind. I-2, Y1. 3.35
Johnstown,Pa. B2 ..... 3.35
KansasCity,Mo. S5 .... 3.95
Lackawanna,N.Y. B2 .. 3.35
LosAngeles B3 ..... 4.05
Marion,O. P11 ..... 3.35
Midland,Pa. C18 ..... 3.35
Milton,Pa. B6 ..... 3.35
Minnequa,Colo. C10 .... 3.85
Niles,Calif. P1 ..... 4.05
N.Tonawanda,N.Y. B11 .3.35
Pittsburg,Calif. C11 .... 4.05
Pittsburgh J5 ..... 3.35
Portland,Oreg. O4 ..... 4.10
Seattle B3, N14 ..... 4.10
S.Chicago C3, R2, W14.. 3.35
So.Duquesne,Pa. C3 .... 3.35
S.SanFran.,Cal. B3 .... 4.10
Struthers,O. Y1 ..... 3.35
Torrance,Calif. C11 .... 4.05
Weirton,W.Va. W6 ..... 3.35
Youngstown C3, R2 .... 3.35

BAR SIZE ANGLES; S. SHAPES

Aliquippa,Pa. J5 ..... 3.35
Atlanta,Ga. A11 ..... 3.50
Bethlehem,Pa.(2) B2 .... 3.55
Johnstown,Pa. B2 ..... 3.35
Lackawanna,N.Y. B2 .. 3.35
Niles,Calif. P1 ..... 4.05
Pittsburgh(23) J5 ..... 3.35
Portland,Oreg. O4 ..... 4.10
SanFrancisco S7 ..... 4.05
Weirton,W.Va. W6 .... 3.35

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ..... 3.75
Buffalo R2 ..... 3.75
Canton,O. R2, T7 ..... 3.75
Clairton,Pa. C3 ..... 3.75
Ecorse,Mich. G5 ..... 4.05
Fontana,Calif. K1 ..... 4.75
Gary,Ind. C3 ..... 3.75
Houston,Tex. S5 ..... 4.15
Ind.Harbor,Ind. I-2, Y1. 3.75
Johnstown,Pa. B2 ..... 3.75
KansasCity,Mo. S5 .... 4.35
Lackawanna,N.Y. B2 .. 3.75
LosAngeles B3 ..... 4.80
Massillon,O. R2 ..... 3.75
Midland,Pa. C18 ..... 3.75
S.Chicago C3, R2, W14.. 3.75
So.Duquesne,Pa. C3 .... 3.75
Struthers,O. Y1 ..... 3.75
Warren,O. C17 ..... 3.75
Youngstown C3 ..... 3.75

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. C3 ..... 4.00
Fontana,Calif. K1 ..... 4.75
Gary,Ind. C3 ..... 4.00
Youngstown C3 ..... 4.00

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 5.10
Bessemer,Ala. T2 ..... 5.10
Bethlehem,Pa. B2 ..... 5.10
Clairton,Pa. C3 ..... 5.10
Cleveland R2 ..... 5.10
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.10
Fontana,Calif. K1 ..... 6.15
Gary,Ind. C3 ..... 5.10
Ind.Harbor,Ind. I-2, Y1. 5.10
Johnstown,Pa. B2 ..... 5.10
Lackawanna,N.Y. B2 .. 5.10
Pittsburgh J5 ..... 5.10
So.Duquesne,Pa. C3 .... 5.10
Struthers,O. Y1 ..... 5.10
Youngstown C3 ..... 5.10

BARS, Cold-Finished Carbon

Aliquippa,Pa. K5 ..... 4.00
Ambridge,Pa. W18 ..... 4.00
BeaverFalls, M12, R2.. 4.00
Buffalo B5 ..... 4.00
Camden,N.J. P13 ..... 4.48
Carnegie,Pa. C12 ..... 4.00
Chicago W18 ..... 4.00
Cleveland A7, C20 ..... 4.00
Cumberland,Md. C19 ... 3.95
Donora,Pa. A7 ..... 4.00
Ecorse,Mich. G5 ..... 4.30
Elyria,O. W8 ..... 4.00
FranklinPark,Ill. N5 ... 4.00
Gary,Ind. R2 ..... 4.00
Hammond,Ind. L2, M13.4.00
Hartford,Conn. R2 ..... 4.40
Harvey,Ill. B5 ..... 4.00
Indianapolis M13 ..... 4.20
LosAngeles R2 ..... 5.40
Mansfield,Mass. B5 .... 4.40
Massillon,O. R2, R8.... 4.00
Midland,Pa. C18 ..... 4.00
Monaca,Pa. S17 ..... 4.00
Newark,N.J. W18 ..... 4.40
Plymouth,Mich. P5 ..... 4.25
Pittsburgh J5 ..... 3.95
Putnam,Conn. W18 .... 4.40
Readville,Mass. C14 .... 4.40
St.Louis,Mo. M5 ..... 4.35
So.Chicago,Ill. W14 .... 4.00
SpringCity,Pa.(5) K3 .. 4.48
Struthers,O. Y1 ..... 4.00
Waukegan,Ill. A7 ..... 4.00
Youngstown F3, Y1..... 4.00

BARS, Cold-Finished Alloy

Aliquippa,Pa. K5 ..... 4.65
Ambridge,Pa. W18 ..... 4.65
BeaverFalls,Pa. M12 ... 4.65
Bethlehem,Pa. B2 ..... 4.65
Buffalo B5 ..... 4.65
Canton,O. R2, T7..... 4.65
Carnegie,Pa. C12 ..... 4.65
Chicago W18 ..... 4.65
Cleveland A7, C20 ..... 4.65
Donora,Pa. A7 ..... 4.65
Elyria,O. W8 ..... 4.65
Gary,Ind. R2 ..... 4.65
Hammond,Ind. L2, M13.4.65
Hartford,Conn. R2 ..... 4.95
Harvey,Ill. B5 ..... 4.65
Indianapolis M13 ..... 4.85
Lackawanna,N.Y. B2 .. 4.65
Mansfield, Mass. B5... 4.95
Massillon,O. R2, R8.... 4.65
Midland,Pa. C18 ..... 4.65
Monaca,Pa. S17 ..... 4.65
Newark,N.J. W18 ..... 4.95
So.Chicago,Ill. R2, W14.4.65
Struthers,O. Y1 ..... 4.65
Waukegan,Ill. A7 ..... 4.65
Worcester,Mass. A7 .... 4.95
Youngstown F3, Y1..... 4.65

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2 .. 3.35
Alton,Ill.(6) L1 ..... 3.35
Atlanta,Ga. A11 ..... 3.50
Buffalo R2 ..... 3.35
Cleveland R2 ..... 3.35
Emeryville,Calif. J7 .... 4.10
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 ..... 4.00
Gary,Ind. C3 ..... 3.35
Houston,Tex. S5 ..... 3.75
Ind.Harbor,Ind. I-2, Y1 .3.35
Johnstown,Pa. B2 ..... 3.35
KansasCity, Mo. S5..... 3.95
Lackawanna,N.Y. B2 .. 3.35
LosAngeles B3 ..... 4.05
Minnequa,Colo. C10 .... 4.25
Niles,Calif. P1 ..... 4.05
Pittsburg,Calif. C11 .... 4.05
Pittsburgh J5 ..... 3.35
Portland,Oreg. O4 ..... 4.10
Seattle, Wash. B3, N14.. 4.10
So.Chicago,Ill. R2 ..... 3.35
So.Duquesne,Pa. C3 .... 3.35
So.SanFrancisco B3 .... 4.10
SparrowsPoint,Md. B2.. 3.35
Struthers,O. Y1 ..... 3.35
Torrance,Calif. C11 .... 4.05
Youngstown C3, R2 .... 3.35

BARS, Reinforcing (Fabricated; to Consumers)

Huntington,W.Va. W7 .. 4.50
Johnstown,¼-1" B2 .... 4.25
LosAngeles B3 ..... 5.00
Marion,O. P11 ..... 4.25
Pittsburgh J5 ..... 4.25
Seattle B3, N14 ..... 5.00
So.SanFrancisco B3 .... 5.00
SparrowsPt.,1⅛-1¼" B2.. 4.83
SparrowsPt.,¼-1" B2 .. 4.25

RAIL STEEL BARS

ChicagoHts.,Ill.(3) I-2 .. 3.25
FortWorth,Tex.(4) T4 .. 4.33
Hntngtn,W.Va.(3) W7 .. 3.35
Moline,Ill.(3) R2 ..... 3.35
Williamsport(2,3) S19 .. 3.35
Williamsport(4) S19 ... 3.85

BARS, Wrought Iron

Economy,Pa.(S.R.)B14.. 9.50
Economy,Pa.(D.R.)B14.11.00
Economy(Stablt) B14 .. 11.30
McK.Rks.(S.R.) L5 .... 8.60
McK.Rks.(D.R.) L5 .... 11.25
McK.Rks.(Staybolt) L5.. 12.75

BARS, Hot-Rolled Ingot Iron

Ashland,Ky.(17) A10 ... 3.60

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2 .. 3.25
Ashland,Ky.(8) A10 .... 3.25
Butler,Pa. A10 ..... 3.25
Cleveland J5, R2 ..... 3.25
Conshohocken,Pa. A3 .. 3.35
Ecorse,Mich.(8) G5 .... 3.45
Fairfield,Ala. T2 ..... 3.25
Fontana,Calif. K1 ..... 4.15
Gary,Ind. C3 ..... 3.25
Ind.Harbor,Ind. I-2, Y1.. 3.25
Irvin,Pa. C3 ..... 3.25
Kokomo,Ind. C16 ..... 3.35
Lackawanna,N.Y. B2 .. 3.25
Munhall,Pa. C3 ..... 3.25
Niles,O. M4 ..... 3.25
Pittsburg,Calif. C11 .... 3.95
Pittsburgh J5 ..... 3.25
Sharon,Pa. S3 ..... 3.25
So.Chicago,Ill. W14 .... 3.25
SparrowsPoint,Md. B2 .. 3.25
Steubenville,O. W10 .... 3.25
Torrance,Calif. C11 .... 3.95
Warren,O. R2 ..... 3.25
Weirton,W.Va. W6 ..... 3.25
Youngstown C3, Y1 .... 3.25

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)

AlabamaCity,Ala. R2 .... 4.40
Dover,O. R1 ..... 5.00
Fairfield,Ala. T2 ..... 4.15
Ind.Harbor,Ind. I-2 .... 4.15
Kokomo,Ind. C16 ..... 4.25
Mansfield,O. E6 ..... 4.15
Niles,O. N12, M4 ..... 4.15
Torrance,Calif. C11 .... 5.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10 ..... 4.00
Cleveland J5 R2 ..... 4.00
Ecorse,Mich. G5 ..... 4.20
Fairfield,Ala. T2 ..... 4.00
Follansbee,W.Va. F4 ... 4.00
Fontana,Calif. K1 ..... 4.90
Gary,Ind. C3 ..... 4.00
GraniteCity,Ill. G4 .... 4.20
Ind.Harbor,Ind. I-2, Y1.4.00
Irvin,Pa. C3 ..... 4.00
Lackawanna,N.Y. B2. .. 4.00
Middletown,O. A10 .... 4.00
Niles,O. M4 ..... 4.00
Pittsburg,Calif. C11 .... 4.95
Pittsburgh J5 ..... 4.00
SparrowsPoint,Md. B2.. 4.00
Steubenville,O. W10 .... 4.00
Warren,O. R2 ..... 4.00
Weirton,W.Va. W6 ..... 4.00
Youngstown Y1 ..... 4.00

SHEETS, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5, R2 ..... 6.05
Ecorse,Mich. G5 ..... 6.25
Fontana,Calif. K1 ..... 6.95
Gary,Ind. C3 ..... 6.05
Ind.Harbor,Ind. I-2, Y1.6.05
Irvin,Pa. C3 ..... 6.05
Lackawanna,N.Y. B2 .. 6.05
Pittsburgh J5 ..... 6.05
Sharon,Pa. S3 ..... 6.05
SparrowsPoint,Md. B2.. 6.05
Warren,O. R2 ..... 6.05
Weirton,W.Va. W6 ..... 6.05
Youngstown Y1 ..... 6.05

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....4.95
Conshohocken,Pa. A3 ...4.95
Ecorse,Mich. G5 .....5.15
Fairfield,Ala. T2 .....4.95
Fontana,Calif. K1 .....6.64
Gary,Ind. C3 .....4.95
Ind.Harbor,Ind. I-2, Y1.4.95
Irvin,Pa. C3 .....4.95
Lackawanna,N.Y. B2 ..4.95
Pittsburgh J5 .....4.95
Sharon,Pa. S3 .....4.95
So.Chicago,Ill. C3 ....4.95
SparrowsPoint,Md. B2 ..4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 .....4.95
Youngstown C3, Y1 ....4.95

SHEETS, Gal'zd No. 10 Steel

AlabamaCity,Ala. R2 ..4.40
Ashland,Ky.(8) A10 ....4.40
Canton,O. R2 .....4.40
Delphos,O. N16 .....5.40
Dover,O. R1 .....5.40
Fairfield,Ala. T2 .....4.40
Gary,Ind. C3 .....4.40
GraniteCity,Ill. G4 ....4.60
Ind.Harbor,Ind. I-2 ...4.40
Irvin,Pa. C3 .....4.40
Kokomo,Ind. C16 .....4.50
MartinsFerry,O. W10 ..4.40
Niles,O. N12 .....4.40
Pittsburg,Calif. C11 ....5.15
SparrowsPoint,Md. B2 ..4.40
Steubenville,O. W10 ....4.40
Torrance, Calif. C11 ....5.15
Weirton,W.Va. W6 ....4.40

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. C3 .....6.75
SparrowsPoint,Md. B2 ..6.75

SHEETS, Galvannealed Steel

Canton,O. R2 .....4.95
Irvin,Pa. C3 .....4.95
Kokomo,Ind. C16 .....5.05
Niles,O. N12 .....4.95

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10 .....4.65
Middletown,O. A10 ....4.65

SHEETS, Electro Galvanized

Cleveland R2 .....5.15
Niles,O. R2 .....5.15
Weirton,W.Va. W6 ....5.00

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2 ....5.05

SHEETS, Culvert, No. 16 Flat

	Cu Alloy	Cu FE
Ashland A10	5.00	...
Canton,O. R2 ...	5.05	5.50
Fairfield,Ala. T-2	5.00	5.35
Gary C3	5.00	5.35
GraniteCity G4 ..	5.40	5.70
Irvin C3	5.00	5.35
Kokomo C16	5.40	...
MartinsFy,O. W10	5.00	5.35
Pittsburg,Cal. C11	5.75	...
SparrowsPt. B2 .	5.00	...
Torrance,Cal. C11	5.75	...

SHEETS, Culvert, No. 16 Flat Ingot Iron

Ashland,Ky. A10 .....5.25

SHEETS, Well Casing

Torrance,Calif. C11 ....4.75
Youngstown C3 .....3.75

SHEETS, ALUMINIZED

Butler,Pa. A10 .....7.75

SHEETS, Long Terne, Steel (No. 10; Commercial Quality)

BeechBotm.,W.Va. W10.4.80
Gary,Ind. C3 .....4.80
Mansfield,O. E6 .....4.80
Middletown,O. A10 ....4.80
Weirton,W.Va. W6 .....4.80

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3 .....$17.50
Yorkville, O. W10 .....17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2 .....$6.75
Gary,Ind. C3 .....6.65
Ind.Harbor,Ind. I-2 ....6.65
Irvin,Pa. C3 .....6.65
Weirton,W.Va. W6 .....6.65
Yorkville,O. W10 .....6.65

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10 .....$7.20

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3 .....$8.10
Yorkville,O. W10 .....8.10

SHEETS, Coated Ternes, 12 lb

Gary,Ind. C3 .....8.95
Yorkville,O. W10 .....8.95

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....5.20

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10 ....3.50
Cleveland R2 .....3.85
Ind.Harbor,Ind. I-2 ....3.50
Warren,O. R2 .....3.85

SHEETS, Cold-Rolled Ingot Iron

Cleveland R-2 .....4.60
Middletown,O. A10 .....4.50
Warren,O. R2 .....4.60

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10 ....4.65
Canton,O. R2 .....5.15
Ind.Harbor,Ind. I-2 ....4.95

SHEETS, ZINCGRIP No. 10 Flat, Ingot Iron

Butler,Pa. A10 .....4.90
Middletown,O. A10 .....4.90

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5 .....5.30
Follansbee,W.Va. F4 ...5.30
Gary,Ind. C3 .....5.30
GraniteCity,Ill. G4 .....5.50
Ind.Harbor,Ind. Y1 ....5.30
Irvin,Pa. C3 .....5.30
Niles,O. R2 .....5.30
SparrowsPoint,Md. B2 5.40
Warren,O. R2 .....5.30
Yorkville,O. W10 .....5.30

SHEETS, Enam'lg. Iron, No. 12

Ashland,Ky.(8) A10 ....4.40
Cleveland R2 .....4.40
Ecorse,Mich. G5 .....4.70
Gary,Ind. C3 .....4.40
GraniteCity,Ill. G4 .....4.60
Ind.Harbor,Ind. I-2 ....4.40
Irvin,Pa. C3 .....4.40
Middletown,O. A10.....4.40
Niles,O. M4 .....4.40
Youngstown Y1 .....4.40

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5 ....$5.75
Fairfield,Ala. T2 .....5.85
Gary,Ind. C3 .....5.75
GraniteCity,Ill. G4 .....5.95
Ind.Harbor,Ind. I-2, Y1.5.75
Irvin,Pa. C3 .....5.75
Niles,O. R2 .....5.75
Pittsburg,Calif. C11 ....6.50
SparrowsPoint,Md. B2 ..5.85
Warren,O. R2 .....5.75
Weirton,W.Va. W6 .....5.75
Yorkville,O. W10 .....5.75

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.50	$7.75
Fairfield,Ala. T2.	7.60	7.85
Gary C3	7.50	7.75
Gran.City,Ill G4.	7.70	7.95
Ind.Harb. I-2, Y1	7.50	7.75
Irvin,Pa. C3	7.50	7.75
Pitts.,Cal. C11 ..	8.25	8.50
Sp.Pt.,Md. B2 ..	7.60	7.85
Warren R2	7.50	7.75
Weirton W6	7.50	7.75
Yorkville,O. W10.	7.50	7.75

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....3.50
Warren,O. R2 .....3.85

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....4.60

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1 .....3.25
Ashland,Ky.(8) A10 ....3.25
Atlanta A11 .....3.40
Bessemer,Ala. T2 .....3.25
Bridgeprt,Conn.(10) S15.3.25
Butler,Pa. A10 .....3.25
Carnegie,Pa. S18 .....3.25
Detroit M1 .....3.45
Ecorse,Mich. G5 .....3.45
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....4.40
Gary,Ind. C3 .....3.25
Houston,Tex. S5 .....3.65
Ind.Harbor,Ind. I-2, Y1.3.25
KansasCity,Mo.(9) S5 ..3.85
Lackawanna,N.Y. B2 ..3.25
LosAngeles B3 .....4.00
Milton,Pa. B6 .....3.25
Minnequa, Colo. C10 ....4.30
NewBritain(10) S15 ....3.25
N.Tonawanda,N.Y. B11 .3.30
Pittsburg,Calif. C11 ....4.00
Pittsburgh J5 .....3.25
Riverdale,Ill. A1 .....3.25
SanFrancisco S7 .....4.00
Seattle B3, N14 .....4.25
Sharon,Pa. S3 .....3.50
So.Chicago,Ill. W14 ....3.25
So.SanFrancisco B3 ....4.00
SparrowsPoint,Md. B2 ..3.25
Torrance,Calif. C11 ....4.00
Warren,O. R2 .....3.25
Weirton,W.Va. W6 .....3.25
WestLeechburg,Pa. A4 ..3.25
Youngstown C3, Y1 ....3.25

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15.5.10
Carnegie,Pa. S18 .....5.10
Fontana,Calif. K1 .....6.30
Gary,Ind. C3 .....5.10
Houston,Tex. S5 .....5.50
KansasCity,Mo. S5 ....5.70
NewBritn,Conn.(10) S15.5.10
Sharon,Pa. S3 .....5.10
Youngstown C3 .....5.10

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15.9.50
Carnegie,Pa. S18 .....9.50
Cleveland A7 .....9.50
Dover,O. G6 .....9.50
Harrison,N.J. C18 .....9.80
NewBritn,Conn.(10) S15.9.50
Pawtucket,R.I.(11) N8..9.50

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.25-0.40c	0.40-0.60c	0.60-0.80c	0.80-1.05c	1.0 1.3
Bridgeprt,Conn.(10) S15	4.00	5.50	6.10	8.05	10.3
Bristol,Conn. W1	....	...	6.40	8.35	...
Carnegie,Pa. S18	....	...	5.50	6.10	8.05	10.3
Chicago T6	4.25	5.65	6.25	8.20	10.5
Cleveland A7	4.00	5.50	6.10	8.05	10.3
Dover,O. G6	4.00	5.50	6.10	7.85	10.1
Harrison,N.J. C18	....	...	6.40	8.35	10.6
Mattapan,Mass. T6	4.50	5.80	6.40	8.35	10.6
NewBritn.,Conn.(10) S15	4.00	5.50	6.10	8.05	10.3
NewCastle,Pa. B4	4.00	5.50	6.10	...	...
NewCastle,Pa. E5	4.00	5.50	6.10	8.05	10.3
NewYork W3	...	5.80	6.40	8.35	10.6
Pawtucket,R.I. N8 .... Cleve.orPitts.Base	4.55	5.50	6.10	8.05	10.3
Worcester,Mass.Base .	4.50	5.80	6.40	8.35	10.6
Sharon,Pa. S3	4.00	5.50	6.10	8.05	10.3
Trenton,N.J. R5	...	6.30	6.90	8.85	11.1
Union,N.J. H6	4.40	6.35	6.35	8.30	10.5
Wallingford,Conn. W2 ..	4.50	5.80	6.40	8.05	10.3
Weirton,W.Va. W6	4.00	5.50	6.10	8.05	10.3
Worcester,Mass. A7	4.30	5.80	6.40	8.35	10.6
Worcester,Mass, T6	4.50	5.80	6.40	8.35	10.6
Youngstown C8	4.50	5.50	6.10	8.05	10.3
Pawtucket,R.I.(12) N8..					9.1
Sharon,Pa. S3					9.1
Worcester,Mass. A7					9.
Youngstown C8					9.

STRIP, Cold-Rolled Carbon

Berea,O. C7 .....6.
Bridgeprt,Conn.(10) S15.4.
Butler,Pa. A10 .....4.
Chicago,Ill. T6 .....4.
Cleveland A7, J5 ....4.
Detroit, D2, D3 .....4.
Detroit M1 .....4.
Dover,O. G6 .....4.
Ecorse,Mich. G5 .....4.
Follansbee,W.Va. F4 ...4.
Fontana,Calif. K1 .....4.
Ind.Harbor,Ind. I-2 ....4.
Lackawanna,N.Y. B2 ...4.
LosAngeles C1 .....5.
Mattapan,Mass.(21) T6.4.
Middletown,O. A10 ....4.
NewBritain(10) S15 ....4.
NewCastle,Pa. B4, E5..4.
NewHaven,Conn. A7, D2.4.
NewKensington,Pa. A6..4.
NewYork W3 .....5.
Pawtucket,R.I.(11) N8 .4.
Pawtucket,R.I.(21) N8 .4.
Pawtucket,R.I. R3 .....4.
Pittsburgh J5 .....4.
Riverdale,Ill. A1 .....4.
Sharon,Pa. S3 .....4.
SparrowsPoint,Md. B2 ..4.
Trenton,N.J.(13) R5 ..5.
Wallingford,Conn. W2 ..4.
Warren,O. R2, T5 .....4.
Weirton,W.Va. W6 .....4.
Youngstown C8, Y1 ....4.

STRIP, Cold-Rolled, High-strength Low-Alloy

Cleveland A7, J5 .....6.
Dover,O. G6 .....6.
Ecorse,Mich. G5 .....6.
Fontana,Calif. K1 .....6.
Lackawanna,N.Y. B2 ...6.
Pittsburgh J5 .....6.
Sharon,Pa. S3 .....6.
SparrowsPoint,Md. B2 ..6.
Warren,O. R2 .....6.
Weirton,W.Va. W6 .....6.
Youngstown Y1 .....6.

STRIP, Electro Galvanized

Weirton,W.Va. W6 .....4.

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.45	$6.70	$7.00
Fairfield,Ala. T2	6.55	6.80	7.10
Gary,Ind. C3	6.45	6.70	7.00
GraniteCity,Ill. G4	6.65	6.90	7.20
Ind.Harbor,Ind. I-2, Y1	6.45	6.70	7.00
Irvin,Pa. C3	6.45	6.70	7.00
Niles,O. R2	6.45	6.70	7.00
Pittsburg,Calif. C11	7.20	7.45	7.75
SparrowsPoint,Md. B2	6.55	6.80	7.10
Weirton,W.Va. W6	6.45	6.70	7.00
Yorkville,O. W10	6.45	6.70	7.00

SHEET SILICON (24 Gage Base)

	Field	Arm.	Elec.	Motor	Dyn.
BeechBottom,W.Va. W10	...	5.45	5.95	6.70	7.50
Brackenridge,Pa. A4	...	...	5.95	6.70	7.50
Follansbee,W.Va. F4	...	...	5.95	6.70	7.50
GraniteCity,Ill. G4	...	...	6.15	6.90	7.70
Ind.Harbor,Ind. I-2	5.15	5.45	5.95	...	...
Mansfield,O. E6	5.15	5.45	5.95	6.70	...
Niles,O. M4	5.15	5.45	5.95	...	...
Niles,O. N12	...	5.45	5.95	...	...
Toronto,O. F4	...	5.45	5.95	6.70	7.50
Vandergrift,Pa. C3	...	5.45	5.95	6.70	7.50
Warren,O. R2	...	5.45	5.95	6.70	...
Zanesville,O. A10	...	5.45	5.95	6.70	7.50

COILS AND CUT LENGTHS, Cold-Rolled, Silicon

	Field	Arm.	Elec.	Motor	Dyn.
Vandergrift,Pa. C3	...	5.70	6.20	6.95	7.75
Warren,O. R2	5.40	5.70	6.20	6.95	7.75

SHEETS, Silicon Transformer Grade

	72	65	58	52
BeechBottom,W.Va. W10	8.05	8.60	9.30	10.10
Brackenridge,Pa. A4	8.05	8.60	9.30	....
Follansbee,W.Va. F4	8.05	8.60	9.30	10.10
Toronto,O. F4	8.05	8.60	9.30	10.10
Vandergrift,Pa. C3	8.05	8.60	9.30	10.10
Zanesville,O. A10	8.05	8.60	9.30	10.10

COLD-REDUCED COILS and Cut Lengths, Silicon

	72	T-100	T-90	T-80
Butler,Pa. A10	...	12.35	13.60	14.85
Vandergrift,Pa. C3	8.30	11.35	12.60	13.85
Warren,O. R2	8.30	....	....	....

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.

C1 Calif. Cold-Rolled Steel
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cld.Roll.MillsCo.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Col. Steel & Shafting Co.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Co.
D4 Disston & Sons,Henry
D6 Driver Harris Co.

E1 Eastrn.Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliot Bros. Steel Co.
E6 Empire Steel Co.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F6 Fretz-Moon Tube Co.

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.
H6 Hind Steel Co.Inc.

I-1 Igoe Bros.Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

IP, Hot-Rolled, High-Strength Low-Alloy

ssemer,Ala. T2	4.95
veland J5	4.95
orse,Mich. G5	5.15
irfield,Ala. T2	4.95
ntana,Cal. K1	6.64
ry,Ind. G3	4.95
Harb.,Ind. I-2, Y1	4.95
ckawanna,N.Y. B2	4.95
tsburgh J5	4.95
aron,Pa. S3	4.95
arrowsPoint,Md. B2	4.95
arren,O. R2	4.95
irton,W.Va. W6	4.95
ungstown C3, Y1	4.95

SHT COOPERAGE HOOP

lanta A11	3.60
verdale,Ill. A1	3.60
aron,Pa. S3	3.60
ungstown C3	3.60

IRE, Cold-Rolled Flat

icago T6	5.35
eveland A7	5.00
ver,O. G6	5.00
ostoria,O. S1	5.50
komo,Ind. C16	5.00
assillon,O. R8	5.00
nessen,Pa. P7	5.00
wtucket,R.I.(11) N8	5.55
wtucket,R.I.(12) N8	5.50
enton,N.J. R5	5.80
orcester,Mass. A7	5.30
orcester,Mass. T6	5.30

IRE, Fine and Weaving (8-in. Coils)

artonville,Ill.(19) K4	7.70
ffalo W12	7.70
icago W13	7.70
eveland A7	7.70
ostoria,O. S1	8.20
hnstown,Pa. B2	7.70
komo,Ind. C16	7.70
lmer,Mass. W12	8.00
rtsmouth,O. P12	7.70
uthers,O. Y1	7.70
enton,N.J. R5	8.50
ukegan,Ill. A7	7.70
orcester, Mass. A7, T6	8.00

IRE (16 gage)	**An'ld. Stone**	**Galv. Stone**
liquippa J5	9.05	10.55
artnvill(19) K4	9.05	10.55
eveland A7	9.05	10.55
ostoria,O. S1	9.15	10.65
hnstown B2	9.05	10.55
komo C16	9.05	10.10
nnecua C10	9.40	10.90
lmer,Mass. W12	9.35	10.85
itts.,Cal. C11	9.40	10.90
rtsmth.(18) P12	9.05	10.55

OPE WIRE	**Mild Plow**	**Plow**	**Imp. Plow**
artonville,Ill. K4	7.10	7.40	7.80
ffalo W12	7.50	7.80	8.20
eveland A7	7.50	7.80	8.20
onora,Pa. A7	7.50	7.80	8.20
ostoria,O. S1	8.00	8.30	8.70
hnstown,Pa. B2	7.50	7.80	8.20
nessen,Pa. P7	7.50	7.80	8.20
wHaven,Conn. A7	7.80	8.10	8.50
lmer,Mass. W12	7.80	8.10	8.50
rtsmouth,O. P12	7.50	7.80	8.20
arrowsPoint,Md. B2	7.60	7.90	8.30
truthers,O. Y1	7.50	7.80	8.20
renton,N.J. A7	7.80	8.10	8.50
renton,N.J. R5	8.00	8.30	8.70
ukegan,Ill. A7	7.50	7.80	8.20
illiamsport,Pa. B2	7.60	7.90	8.30
orcester,Mass. J4	7.50	7.80	8.20
SparrowsPt, B2	9.15	10.65	
Struthers Y1	9.05	10.55	
Waukegan A7	9.05	10.55	

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.15
Aliquippa,Pa. J5	4.15
Alton,Ill.(1) L1	4.15
Bartonville,Ill.(1) K4	4.15
Buffalo W12	4.15
Chicago W13	4.15
Cleveland A7, C20	4.15
Crawfrdsvll,Ind. M8	4.30
Donora,Pa. A7	4.15
Duluth A7	4.15
Fairfield,Ala. T2	4.15
Fostoria,O.(24) S1	4.65
Houston S5	4.55
Johnstown,Pa. B2	4.15
Joliet,Ill. A7	4.15
KansasCity,Mo. S5	4.75
Kokomo,Ind. C16	4.25
LosAngeles B3	5.10
Minnequa,Colo. C10	4.50
Monessen,Pa. P7	4.15
Newark,6-8ga. I-1	4.75
No.Tonawanda B11	4.18
Palmer,Mass. W12	4.45
Pittsburg,Calif. C11	5.10
Portsmouth,O. P12	4.15
Rankin,Pa. A7	4.15
So.Chicago,Ill. R2	4.15
So.SanFrancisco C10	5.10
SparrowsPoint,Md. B2	4.25
Sterling,Ill.(1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	5.10
Waukegan,Ill. A7	4.15
Worcester,Mass. A7, T6	4.45

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Bartonville,Ill.(19) K4	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Fostoria,O. S1	6.05
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Milbury,Mass.(12) N6	5.85
Monessen,Pa. P7	5.55
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Trenton,N.J. A7	5.85
Trenton,N.J. R5	6.35
Waukegan,Ill. A7	5.55
Worcester A7,J4,T6,W12	5.85

WIRE, Merchant Quality (6 to 8 gage)

	An'ld.	Galv.
Ala.,City, R2	4.80	5.25
Aliquippa J5	4.80	5.25
Atlanta A11	4.90	5.35
Bartnville.(19) K4	4.80	5.25
Buffalo W12	4.80	...
Cleveland A7	4.80	5.25
Crawfrdvll. M8	4.95	5.40
Donora A7	4.80	5.25
Duluth A7	4.80	5.25
Fairfield T2	4.80	5.25
Houston,Tex. S5	5.20	5.65
Johnstown B2	4.80	5.25
Joliet,Ill. A7	4.80	5.25
KansasCity,Mo. S5	5.40	5.85
Kokomo C16	4.90	5.35
LosAngeles B3	5.75	...
Minnequa C10	5.15	5.60
Monessen P7	4.80	5.25
Palmer,Mass. W12	5.10	...
Pitts.,Cal. C11	5.75	6.20
Portsmth.(18) P12	4.80	5.25
Rankin A7	4.80	5.25
So.Chicago R2	4.80	5.25
So.S.Fran. C10	5.75	6.20
SparrowsPt. B2	4.90	5.35
Sterling,Ill.(1)N15	4.80	5.25
Struthers,O. Y1	4.80	5.25
Torrance,Cal. C11	5.75	...
Worcester A7	5.10	5.55

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.20
Alton,Ill.(1) L1	5.20
Buffalo W12	5.20
Cleveland A7	5.20
Donora, Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
LosAngeles B3	6.15
NewHaven,Conn. A7	5.50
Palmer,Mass. W12	5.50
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
So.Chicago,Ill. R2	5.20
SparrowsPoint,Md. B2	5.30
Struthers,O. Y1	5.20
Torrance,Calif. C11	6.15
Trenton,N.J. A7	5.50
Waukegan,Ill. A7	5.20
Worcester,Mass. A7	5.50

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	123
Aliquippa,Pa. J5	123
Atlanta A11	125
Bartonville,Ill.(19) K4	123
Crawfordsville M8	126
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Houston,Tex. S5	131
Johnstown,Pa. B2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	130
Monessen,Pa. P7	123
Pittsburg,Calif. C11	143
Portsmouth,O.(18) P12	123
Rankin,Pa. A7	123
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	143
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

FENCE POSTS

	Col.
Duluth A7	112
Huntington,W.Va. W7	112
Johnstown,Pa. B2	112
Joliet,Ill. A7	112
Minnequa,Colo. C10	120
Moline,Ill. R2	116
Williamspt.Pa., S19	n.t.$120

WOVEN FENCE, 9-15½ gage

	Col.
Ala.City,Ala.,17-18ga. R2	175
AlabamaCity,Ala. R2	109
Aliquip.,Pa 9-14½ga. J5	109
Atlanta A11	111
Bartonville,Ill.(19) K4	109
Crawfordsvll,Ind. M8	112
Donora,Pa. A7	109
Duluth A7	109
Houston,Tex. S5	117
Fairfield,Ala. T2	109
Johnstown,Pa. B2	109
Johnstn,17ga.,6" B2	183
Johnstn,17ga.,4" B2	186
Joliet,Ill. A7	109
KansasCity,Mo. S5	121
Kokomo,Ind. C16	111
Minnequa,Colo. C10	116
Monessen,Pa. P7	109
Pittsburg,Calif. C11	132
Portsmouth,O.(18) P12	109
Rankin,Pa. A7	109
So.Chicago,Ill. R2	109
Sterling,Ill.(1) N15	109

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	106
Atlanta A11	107
Bartonville,Ill.(19) K4	106
Chicago W13	106
Crawfordsville M8	109
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Joliet,Ill. A7	106
Kokomo,Ind. C16	108
Minnequa,Colo. C10	113
Pittsburg,Calif. C11	130
Portsmouth,O.(18) P12	106
So.Chicago,Ill. R2	106
So.SanFran.,Calif. C10	130
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106

NAILS & STAPLES, Stock (To Dealers & Mfrs.)

AlabamaCity,Ala. R2	103
Aliquippa,Pa. J5	103
Atlanta A11	105
Bartonville,Ill.(19) K4	103
Cleveland A9	110
Crawfordsville M8	106
Donora,Pa. A7	103
Duluth A7	103
Fairfield,Ala. T2	103
Houston,Tex. S5	111
Johnstown,Pa. B2	103
Joliet,Ill. A7	103
KansasCity,Mo. S5	115
Kokomo,Ind. C16	105
Minnequa,Colo. C10	110
Monessen,Pa. P7	103
Pittsburg,Calif. C11	122
Portsmouth,O. P12	103
Rankin,Pa. A7	103
So.Chicago,Ill. R2	103
SparrowsPoint,Md. B2	105
Sterling,Ill.(1) N15	103
Torrance,Calif. C11	123
Worcester,Mass. A7	109

NAILS, Cut (100 lb keg)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

NAILS & STAPLES, Stock (To Jobbers)

Chicago,Ill. W13	103
Minnequa,Colo. C10	107
Portsmouth,O. P12	100

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.20
Bartonville,Ill.(19) K4	5.20
Donora,Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
Joliet,Ill. A7	5.20
Kokomo,Ind. C16	5.30
Minnequa,Colo. C10	5.55
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
Rankin,Pa. A7	5.20
So.Chicago,Ill. R2	5.20
SparrowsPoint,Md. B2	5.30
Worcester,Mass. A7	5.50

AXLES

Fairfield,Ala. T2	5.20
Gary,Ind. C3	5.20
Ind.Harbor,Ind. S13	5.20
Johnstown,Pa. B2	5.20
McKeesRocks,Pa. C3	5.20

TIE PLATES

Fairfield,Ala. T2	4.05
Gary,Ind. C3	4.05
Ind.Harbor,Ind. I-2	4.05
Lackawanna,N.Y. B2	4.05
Minnequa,Colo. C10	4.05
Pittsburg,Calif. C11	4.20
Pittsburgh R2	4.05
Seattle B3	4.50
Steelton,Pa. B2	4.05
Torrance,Calif. C11	4.20
Weirton,W.Va. W6	4.05

JOINT BARS

Bessemer,Pa. C3	4.25
Fairfield,Ala. T2	4.25
Ind.Harbor,Ind. I-2	4.25
Joliet,Ill. C3	4.25
Lackawanna,N.Y. B2	4.25
Minnequa,Colo. C10	4.25
Steelton,Pa. B2	4.25

TRACK BOLTS

	(20)Treated
Fairfield,Ala. T2	8.50
Lebanon,Pa. B2	8.50
Minnequa,Colo. C10	8.25
Pittsburgh,Pa. O3, P14	8.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.35
Ind.Harbor,Ind. I-2, Y1	5.35
Kansas City, Mo. S5	5.60
Lebanon,Pa. B2	5.35
Minnequa,Colo. C10	5.35
Pittsburgh J5	5.35
So.Chicago,Ill. R2	5.35
Struthers,O. Y1	5.35
Youngstown R2	5.35

LIGHT RAILS, Rail Steel

Huntington,W.Va. W7	3.55
Williamsport,Pa. S19	3.55

RAILS	**Std. No. 1**	**Std. No. 2**	**Std. All No. 2**	**TeeRails 60 lb. Under**
Bessemer,Pa. C3	3.20	3.10	3.15	3.55
Ensley,Ala. T2	3.20	3.10	3.15	3.55
Fairfield,Ala. T2	...	...	...	3.55
Gary,Ind. C3	3.20	3.10	3.15	...
Ind.Harbor,Ind. I-2	3.20	3.10	3.15	...
Johnstown,Pa. B2	...	...	...(16)	3.55
Lackawanna B2	3.20	3.10	...	3.55
Minnequa,Colo. C10	3.20	3.10	...	4.25
Steelton,Pa. B2	3.20	3.10	...	...

Key to Producing Companies

1 McLouth Steel Corp.
4 Mahoning Valley Steel
5 Medart Co.
6 Mercer Tube & Mfg. Co.
8 Mid-States Steel & Wire
9 Midvale Co.
10 Missouri-Illinois Furnace
12 Moltrup Steel Products
13 Monarch Steel Co.
14 McInnes Steel Co.
2 National Supply Co.
3 National Tube Co.
5 Nelsen Steel & Wire Co.
3 New Eng.High Carb.Wire
8 Newman-Crosby Steel
12 Niles Rolling Mill Co.
14 Nrthwst. Steel Roll. Mills
15 Northwestern S.&W. Co.
16 New Delphos Mfg. Co.
3 Oliver Iron & Steel Corp.
4 Oregon Steel Mills
1 Pacific States Steel Corp.
2 Pacific Tube Co.
5 Pilgrim Drawn Steel
3 Pittsburgh Coke & Chem.
7 Pittsburgh Steel Co.
Pittsburgh Tube Co.
1 Pollak Steel Co.
P12 Portsmouth Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U4 Universal-Cyclops Steel
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Corp.
W7 W. Va. Steel & Mfg. Co.
W8 Wstrn.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Co.
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstwn. Sheet & Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	19.00	18W,4Cr,3V	114.50
Extra Carbon	22.00	18W,4Cr,2V,9Co	168.50
Spec. Carbon	26.50	18W,4Cr,2V,6Co	154.00
Oil Hardening	29.00	18.25W,4.25Cr,1V,4.75Co	142.00
Hi.-Carbon-Cr	52.00	20.25W,4.25Cr,1.6V,12.25Co	266.50
Cr Hot Wrk.	29.00	1.5W,4Cr,1V,8.5Mo	65.00
18W,4Cr,1V	90.50	6.4W,4.5Cr,1.9V,5Mo	69.50
18W,4Cr,2V	102.50	6W,4Cr,3V,6Mo	88.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M9, M14, R2, S8, T7, U4, V2, V3.

(1) Chicago Base. (2) Angles.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia Sal.
(6) Chicago or Birm. Base.
(8) 16 gage and heavier.
(9) 6" and narrower.
(10) Pittsburgh Base.
(11) Cleveland & Pittsburgh Base.
(12) Worcester, Mass. Base.
(13) 3" & wider; over ½" to under 3" 5.50c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh Base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. Base.
(22) Del. San Fran. Bay area.
(23) Angles 1"x1" to 1¼"x1¼" only.
(24) Deduct 0.35c for finer than 15 Ga.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	41.5	39.5	38.5	13.5	11.5	10.5
¼	6.0	0.42	39.5	37.5	36.5	15.5	13.5	12.5
⅜	6.0	0.57	36	34	33	12.5	10.5	9.5
½	8.5	0.85	43	41	42	26.5	24.5	25.5
¾	11.5	1.13	46	44	45	30.5	28.5	29.5
1	17.0	1.68	48.5	46.5	47.5	33.5	31.5	32.5
1¼	23.0	2.28	49	47	48	34	32	33
1½	27.5	2.73	49.5	47.5	48.5	34.5	32.5	33.5
2	37.0	3.68	50	48	49	35	33	34
2½	58.5	5.82	50.5	48.5	49.5	35.5	33.5	34.5
3	76.5	7.62	50.5	48.5	49.5	35.5	33.5	34.5

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va. 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower ⅜", W10; Wheatland, Pa., 2 points lower on ⅛ through ⅜", W9. Following make ½ through 3" only: Lorain, O. N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

Columns B & E: Sparrows Point Md. B2; Wheatland, Pa., ⅛" through ⅜", W9.

Columns C & F: Alton, Ill. (Lorain, O. Base) LI; Indiana Harbor, Ind., ½" through 3", Y1.

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa., ⅛" through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜" W10; Wheatland, Pa., except 2 pts lower on ⅛" through ⅝" W9. Following make ½" through 3" only; Lorain N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	38.5	23	38.5	23
2½	58.5	5.82	41.5	26	41.5	26
3	76.5	7.62	41.5	26	41.5	26
3½	92.0	9.20	43.5	28	43.5	28
4	$1.09	10.89	43.5	28	43.5	28
5	1.48	14.81	43.5	28	43.5	28
6	1.92	19.18	43.5	28	43.5	28

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 4 to 24 in., inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D
1	13	11.50	13.39	13.00	13.00
1¼	13	13.62	15.87	13.21	15.39
1½	13	15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2¼	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pacific Tube Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base 10% Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Carbon Base Both Sides	Copper Base
302	....	....	....	19.75	21.50	75.00	
304	22.50	26.50	....	20.75	22.50	77.00	
305	....	....	....	....	....	79.00	
309	27.00	31.00	....	....	....	....	
310	32.50	36.50	....	....	....	105.00	
316	27.00	31.00	....	26.00	28.00	....	
317	30.50	34.50	....	....	....	....	
318	29.50	33.50	....	....	....	....	
321	23.50	27.50	....	23.00	25.00	90.00	
347	25.00	29.00	....	24.00	26.00	94.00	
405	18.75	24.75	....	....	....	....	
410	18.25	24.25	....	....	....	....	
430	18.25	24.25	....	....	....	....	
Nickel	27.50	34.50	31.50	41.00	....	....	88.00
Inconel	36.00	46.00	....	....	....	....	115.00
Monel	29.00	37.00	26.50	33.50	....	....	83.00
Copper*	....	....	19.75†	23.75†	....	....	....

* Deoxidized. † Deduct 4.25c for hot-rolled. Production for carbon base products are: Stainless plates and sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16 and Coatesville, Pa. L7; nickel, inconel and monel-clad plates, Coatesville L7; nickel, monel and copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie A13.

BOLTS, NUTS

(To consumers)

F.o.b. midwestern plants. Additional discounts on carriage, machine bolts, 5 for cl; 15 for full containers, except tire and plow bolts.

CARRIAGE, MACHINE BOLTS

(Per cent off list)

½-in., smaller; up to 6 in. long 35
⅝ & ¾ x 6 in., shorter. 37
⅞-in. & larger x 6 in., shorter 34
All diameters longer than 6-in. 30
Tire bolts 25
Plow bolts 47
Lag bolts, 6 in., shorter 37
Lag bolts, longer than 6 in. 35

NUTS

Semifinished hexagon	A.S. Reg. & Light	Heavy
⅞-in., smaller	41 off	....
½-in., smaller	....	38 off
½-in.-1-in.	39 off	....
⅞-in.-1-in.	....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in., larger	34 off	28 off

Additional discount of 15 for full containers.

STOVE BOLTS

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

SQUARE HEAD SET SCREWS

Upset 1-in. & smaller.51 off
¾, ⅞, & 1 x 6-in. & shorter .....35 off
Headless, ¼-in., larger.31 off

HEXAGON CAP SCREWS

(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright) ..... 46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter ..... 40 off

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 6.75c
7/16-in., under .....48 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....Net to $1 off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb.
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4,5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	84,90	7.50
14	60,72	8.00
10,12	60	8.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.
Imported, net ton, duty paid, metallurgical grade, $39-$40.

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	37.50	30.50	28.50
302	37.50	33.00	28.50
303	39.50	36.50	31.00
304	39.50	35.00	30.00
309	52.00	52.00	41.50
316	53.00	55.00	46.00
321	45.50	44.50	34.00
347	50.00	48.50	38.50
410	33.00	27.00	23.00
416	33.50	33.50	23.50
420	40.50	43.50	28.50
430	35.50	27.50	23.50
501	24.00	22.50	11.50
502	25.00	23.50	12.50

Baltimore, Types 301 through 347 sheets, except 309 E2.
Baltimore, bars, wire and structurals A10.
Brackenridge, Pa., sheets A4.
Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.
Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18.
Cleveland, strip, except Type 309 quoted 51.00c, and except Type 416 A7.
Detroit, strip, except Type 309 M1.
Dunkirk, N. Y., bars, wire A4.
Duquesne, Pa., bars C3.
Gary, Ind., sheets except Type 416 C3.
Harrison, N. J., strip C18.
Massillon, all products, except Type 309 bars, wire & structurals quoted 42.00c, Type 501, 10.50c, Type 502 11.50c R2.
McKeesport, Pa., bars; sheets except Type 416, C3.
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.
Middletown, O., sheets and strip, except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars C3.
Pittsburgh, sheets C18.
Reading, Pa., bars & strip except Type 309 bars quoted 42.00c C4.
So. Chicago, Ind., bars & structurals C3.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars U4.
Wallingford, Conn., strip, except 309, W2 quotes ¼-cent higher.
Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3.
Washington, Pa., Types 301 through 347 sheets & strip except 303 & 309; 316 sheets 58.00c strip 60.00c W4.
Watervliet, N. Y., structurals & bars A4.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, except Type 309 quoted 51.00 A4.
Youngstown, strip C8.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 20.00
Toluol, one deg...19.00-23.50
Industrial xylol ..20.50-26.50

Per ton bulk, ovens
Sulphate of ammonia..$45.00

Per pound, ovens
Phenol, 40 (carlots, returnable drums) 13.25
Do., less than carlots..14.00
Do., tank cars 12.50

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for min 100 mesh)

Cer

Sponge Iron:
98+% Fe, carlots... 15.
Swedish, c.i.f. New York, in bags..7.40-8.
Electrolytic Iron:
Annealed, 99.5% Fe. 39.
Unannealed, 99+% Fe ..... 33.
Unannealed, 99+% Fe (minus 325 mesh) ..... 48.
Carbonyl Iron:
97.9-99.8%, size 5 to 10 microns..65.00-130.
Aluminum:
1500-lb lots, freight allowed ..... 29.
Atomized, 500-lb drums, freight allowed ..... 30.
Brass, 10-ton lots..23.25-26.
Copper:
Electrolytic 28.6
Reduced ..... 27.
Lead ..... 19.
Manganese:
Minus 100 mesh 52.00-55.
Minus 35 mesh..... 48.
Minus 200 mesh..... 56.
Nickel, unannealed61.00-66.
Silicon .....34.00-40.
Solder (plus cost of metal) ..... 8.
Stainless Steel, 302... 75.
Zinc, 10-ton lots..15.50-18.

Dolla

Tungsten:
99%, minus 80 to 2
mesh, freight allowed,
1000 lb and over .. 2.
500 to 1000 lb .... 2.
less than 500 lb ... 3.
98.8%, minus 65 mes
freight allowed,
1000 lb and over .. 2.
less than 1000 lb .. 3.
Tin 1.0
Molybdenum:
99%, minus 80 to 200 mes
over 500 lb ..... 2.
200 to 500 lb ..... 2.
less than 200 lb .. 2.
82-88%, freight allowed,
2000 lb and over .. 2.
less than 2000 lb .. 2.
Chromium, electrolytic,
99% Cr min..... 3.

METALLURGICAL COK

Price per Net Ton

BEEHIVE OVENS

Connellsvll, fur. $13.00-13.
Connellsvll, fdry 15.50-16.
New River, foundry ...18.
Wise county, foundry..15.
Wise county, furnace..14.

OVEN FOUNDRY COKE

Kearny, N. J., ovens.$22.
Everett, Mass., ovens ....
New England, del.‡..22.
Chicago, ovens .....20.
Chicago, del. .....†21.
Detroit, del. .....23.
Terre Haute, ovens....20.
Milwaukee, ovens ....20.
Indianapolis, ovens....19.
Chicago, del. .....23.
Cincinnati, del. .....22.
Detroit, del. .....23.
Ironton, O., ovens ...19.
Cincinnati, del. ....21.
Painesville, O., ovens..20.
Buffalo, del. .....23.
Cleveland, del. .....22.
Erie, del. .....21.
Birmingham, ovens ....17.
Philadelphia, ovens ...20.
Swedeland, Pa., ovens.20.
Portsmouth, O., ovens.19.
Detroit, ovens .....20.
Detroit, del. .....*21.
Buffalo, del. .....22.
Flint, del. .....23.
Pontiac, del. .....21.
Saginaw, del. .....23.

Includes represents tive switching charge of *, $1.05; †, $1.45, one-trac charge being $1.20, tw tracks $1.40, and three o more tracks $1.50. ‡ C within $4.03 freight zon from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.60	6.51	7.10	5.82	...	5.77	6.31	8.28	5.53	5.85	7.36
New York (c'try)	5.40	6.31	6.90	5.62	...	5.57	6.11	8.08	5.33	5.65	7.16
Boston (city) ..	5.75	6.75**	7.16	5.80	...	5.72	6.22	8.77	5.62	5.95	7.45
Boston (c'try) ..	5.55	6.55**	6.96	5.60	...	5.52	6.02	8.57	5.42	5.75	7.25
Phila. (city)...	5.90	6.45-6.49	6.88	5.65	...	5.65	6.21	8.10	5.35	5.60	6.80
Phila. (c'try) ..	5.65	6.20-6.24	6.63	5.40	...	5.40	5.96	7.85	5.10	5.35	6.55
Balt. (city)....	5.46	6.36	6.81	5.52	...	5.57	6.05	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.66	5.37	...	5.42	5.91	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)..	4.85	5.75[4•]	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse).	5.32	6.22[4•]	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.70	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse) .	4.85	5.75	6.55	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.27‡	5.94**	6.83	5.39	6.10	5.44	5.95	...	5.44	5.64	7.05
Chicago (city) .	5.05	5.95[4]	7.05	5.05	6.35-6.85	5.10	5.60	7.90[8]	5.10	5.30	6.75
Chicago (w'hse)	4.85	5.75[4]	6.85	4.85	6.15-6.65	4.90	5.40	7.70[8]	4.90	5.10	6.55
Milwaukee (city)	5.18	6.08[4]	7.18	5.18	6.48-6.98	5.23	5.78	8.03[8]	5.23	5.43	6.88
Milwau. (c'try).	5.03	5.93[4]	7.03	5.03	6.33-6.83	5.08	5.63	7.88[8]	5.08	5.28	6.73
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[9]	6.64	5.39	5.59	7.04
St. L. (w'hse) .	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[9]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham (c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	5.60	7.15	7.60	6.10	7.75	5.75	7.40	...	5.60	5.65	7.90
L. A. (w'hse)..	5.45	7.00	7.45	5.95	7.60	5.60	7.25	...	5.45	5.50	7.75
San Francisco..	6.15[10]	7.50[8]	7.80	6.75[10]	8.25[8]	5.90[10]	7.55	10.85[3]	5.90	6.35	8.10
Seattle-Tacoma.	6.70†‡	8.15[8]	8.80	6.70†	...	6.20†	8.15[1]	10.10	6.00†	6.35†	8.40†

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); § as rolled; ** 17 gage; †† as annealed. Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.

High-heat Duty: Salina, Pa. $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

LADLE BRICK

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

MALLEABLE BUNG BRICK

St. Louis. Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; Bulk, $30.50-$31; single paper bags, $35-$35.50.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates, contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot:	17.00
Long-term contract	15.00
Brazil iron ore, 68-69%	18.50

TUNGSTEN ORE

Wolframite, scheelite, net ton unit, duty paid	$20-$22

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8: 1	$35.00
48% 3:1	37.50
48% no ratio	28.50-29.00

South African Transvaal

44% no ratio	$19.00-20.00
45% no ratio	19.50-21.00
48% no ratio	27.00-28.00
50% no ratio	28.50-29.00

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	28.00-29.00
48% 3:1 lump	37.50

Domestic—rail nearest seller

48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

Manganese Alloys

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

Chromium Alloys

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(Please turn to page 125)

Tin, Lead Prices Ease Further

Straits offered at 85.00c for prompt delivery while futures are available at sharp concessions. Lead drops to 11.80c, St. Louis, on continued light demands

New York—Restoration of free trading conditions in world tin markets has been followed by a precipitous decline in prices. Within a few days following the reopening of the London and Singapore markets, prices in the former dropped over £105 (13 cents per pound) and over £150 (about 19 cents per pound) in the latter market. The domestic market has declined proportionately, although it has been effected over a longer period. Grade A tin made the initial break from the $1.03 RFC level on Sept. 26 and dropped to 85.60c by Nov. 21, a drop of 18 cents a pound.

Weakness has characterized trading this month also in lead, the market now being quoted on the basis of 11.80c, St. Louis. Copper and zinc display a steady price tone on the basis of 18.50c, Connecticut, and 9.75c, East St. Louis, respectively.

Tin — Tin Sales Corp., selling agency for the Reconstruction Finance Corp., resumed offerings for immediate delivery of Grade A tin at 85.00c, New York, on Monday. Previous differentials for other than spot delivery were reinstated. RFC had withdrawn from the market on Nov. 18. Up to Sept. 28, while RFC was the sole importer and seller of tin to United States consumers, its price had been $1.03. On that date, after American consumers were permitted to buy tin anywhere, the price was lowered to 96.00c a pound. It was reduced to 95.00c on Oct. 24, meeting the price quoted by the British Ministry of Supply at that time.

Meanwhile, the open market for spot tin has slumped to the 85-cent level for spot and as low as 78.00c for February arrival. The market has had practically no consumer buying support during this readjustment period. Refusal of consumers to purchase futures at the substantial price concessions indicates their distrust of the stability of the market.

The British Ministry of Supply holds about 31,000 tons of tin which will be released at a rate insuring reasonable price stability, George Strauss, supply minister, said last week in London. He added that final disposition of any unsold stocks would be considered when the market had time to settle down.

Lead—Lead prices declined ½-cent a pound Nov. 21 to the basis of 11.80c, St. Louis, and 12.00c, New York. The price is now back to the year's low that prevailed from May 26 to July 8. It had recovered to 14.92½c, St. Louis, on Aug. 8 and subsequently has lost all the gain of 3.125 cents.

Forces back of the slow demand for lead and price easiness are the same as have been dominant since early fall. Increased foreign production, lack of United States funds in Europe, and lessened demand abroad have resulted in metal normally consumed in Europe being offered for sale to American consumers. In addition, lead of Yugoslavian and Japanese origin has been offered to consumers here at a concession from the American price.

Meanwhile, makers of lead products in this country are not adding to their inventories now with the yearend at hand. As a result, sales are failing to meet intake of ores, concentrates and scrap. It is the practice of custom smelters to dispose of their intake daily. Scrap lead offerings have increased and custom units have increased their smelting charge for scrap lead battery plates to $70 a ton, equivalent to a discount of 5 cents a pound for lead content.

Effective Nov. 21, prices of lead sheets and pipe declined ½-cent a pound while lead traps and bends, combination lead and iron bends are now quoted at list plus 45 per cent against plus 48 per cent previously. Prices of lead oxides also declined ½-cent a pound.

Copper—Transactions in the copper market continue restricted, due to the relatively small tonnages available for December delivery. Producers are well booked and are maintaining prices at the 18.50-cent level. The supply situation is expected to remain tight well into the new year. Orders booked for November shipment to fabricators exceed 105,000 tons, indicating that deliveries this month will be larger than the October movement of 108,192 tons. Additional tonnages shipped to the government lifted the October total to over 123,000 tons and will similarly swell the November total.

Although the primary copper market still displays a firm to strong undertone, the secondary markets are slightly weaker. The price spread quoted in brass ingot market has widened while some refiners have lowered their bids for scrap.

Zinc—Labor difficulties in Idaho, which had closed down several important lead-zinc producers, have been settled and it is expected that the zinc smelter of Bunker Hill & Sullivan Mining & Concentrating Co. will increase its operations steadily from an estimated rate of 30 per cent for the last several months. The rate is expected to reach 50 per cent of capacity in December and still higher in January. Zinc is quotable at 9.75c, East St. Louis, since several other custom units have joined the one seller at that level who did not follow the rise to 10.00c named by two of the leading producers earlier in November. All but a small tonnage of total business transacted lately has been done at the 9.75-cent level.

Expects Profitable Operations

Boston—Prices of nonferrous metals now are reaching the point of stabilization and no great fluctuations are expected to take place in copper or zinc, Herman W. Steinkraus, president, Bridgeport Brass Co., Bridgeport, Conn., said here last week. Because of inventory write-off caused by the break in metal prices early in the year, Bridgeport Brass showed a net loss for the nine months ended Sept. 30 of $1,562,616 against a net profit of $1,321,852 for the like period a year ago. For the September quarter, the company reported a net profit of $68,388 against $506,627 a year ago.

Bridgeport Brass Co.'s operations now are on a profitable basis and the final quarter of 1949 will be the best for the year, Mr. Steinkraus said. Now that the steel strike is over and the coal situation is likely to improve, there ought to be a good situation in the brass industry with operations at reasonably high levels. While 1950 should be a profitable year for the industry, he does not look for the big volume of 1948, although he said it would be at a much better level than in the first nine months of 1949.

Bridgeport Brass is diversifying its products other than those made of brass and copper. The company expects to bring out at least one new line of products in 1950 which preliminary market tests indicate will have considerable possibilities.

Discuss New Copper Contract

London—Progress has been made towards reaching a price settlement for copper in new contracts between Northern Rhodesian copper companies and the British Ministry of Supply, reports A. Chester Beatty, chairman of Roan Antelope Copper Mines Ltd.

Although no final settlement has been reached, the Ministry has indicated that the previous pricing basis shall be continued. This means that future prices which the Ministry will pay to Northern Rhodesian producers will continue to be hinged to the American quotation converted into pound sterling at the official exchange rate and adjusted by freight and grade differentials.

Roan Antelope's production for the first quarter has been provisionally contracted for on a basis price of 17.62½c per pound for electrolytic copper, f.a.s. New York. The company's sales, which previously had been made for delivery to the Ministry six months ahead, now are on a three months basis.

Lead Mine Output Declines

WASHINGTON — Average daily rate of lead production from domestic mines declined 8 per cent in September from the August level, reports the Bureau of Mines. September lead output, in terms of recoverable metal, was 30,281 net tons, an average of 1009 tons per day, compared with 33,905 tons in August, an average of 1094 tons per day.

The Bureau also reports that August receipts and consumption of lead-base scrap and residues at secondary smelter plants increased 33 and 29 per cent, respectively, compared with July. Net recovery of lead, tin and antimony was 32,038 tons, a gain of 19 per cent.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 18.50c, Conn. Valley, Lake, 18.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 17.25-18.25c; 80-10-2 (No. 215) 26.25c; 80-10-10 (No. 305) 22.75c; No. 1 yellow (No. 405) 14.25-16.00c.

Zinc: Prime western 9.75c, brass special 10.00c, intermediate 10.25c, East St. Louis; high grade 10.75c, delivered.

Lead: Common 11.80c; chemical, 11.90c; corroding, 11.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.50-17.00c; No. 12 foundry alloy (No. 2 grade) 16.25-16.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00-18.25c; grade 2, 17.50-17.75c; grade 3, 16.00-16.25c; grade 4, 15.50-15.75c. Prices include freight at carload rate up to 75 cents per 100 lb.

75 titanium-aluminum alloy No. 1 (low Cu) 21.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt delivery, 85.00c; November arrival, 84.50c; December arrival, 84.00c; January arrival, 79.00c; February arrival, 77.00c; March arrival, 76.00c. Chinese, 99% tin, prompt del., 80.00c; November arrival, 79.00c.

RFC selling prices for prompt delivery, ex-dock New York or f.o.b. Texas City, Tex.: Grade A, 99.8% or higher (including Straits) 85.00c.

Antimony: American 99-99.8% and over but not meeting specifications below, 32.00c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 32.50c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99% (Chinese, English, Belgium), prompt, 26.00c, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $73-75 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, 92 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 73.25c per oz.

Platinum: $69-72 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 18.50-cent copper.)

Sheet: Copper 32.18; yellow brass 28.69; commercial bronze, 95% 32.10; 90%, 31.61; red brass, 85%, 30.60; 80%, 30.12; best quality, 9.58; nickel silver, 18%, 42.27; phosphor-bronze, grade A, 5% 50.90.

Rods: Copper, hot-rolled 28.03; cold-drawn 29.28; yellow brass free cutting, 23.19; commercial bronze, 95% 31.79; 90% 31.30; red brass 85% 30.29; 80% 29.81.

Seamless Tubing: Copper 32.22; yellow brass 31.70; commercial bronze 90% 34.27; red brass 85% 33.51; 80% 33.03.

Wire: Yellow brass 28.98; commercial bronze, 95% 32.39; 90% 31.90; red brass, 85% 30.89; 80% 30.41; best quality brass 29.87.

Copper Wire: Bare soft, f.o.b., eastern mills, 500,000 lb lots 23.30 l.c.l. 23.925, c.l. 23.425; weatherproof, f.o.b. eastern mills, 100,000 lb lots 25.35, l.c.l. 26.10, c.l. 25.60; magnet, delivered, c.l. 28.50, 15,000 lb or more 28.75, c.l. 29.25.

ALUMINUM

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-24	36.8	33.4	39.5
0.008-0.0075	12-24	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	36.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $17.00 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $17.00 per cwt. Traps and bends: List price plus 45%.

ZINC

Sheets, 15.50c f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 15.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.00c; over 12-in., 15.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

DAILY PRICE RECORD

1949	Copper	Lead	Zinc	Tin	Aluminum	timony	Nickel	Silver
Nov. 21-22	18.50	11.80	9.75	85.00	17.00	32.00	40.00	73.25
Nov. 18-19	18.50	12.30	9.75	85.50	17.00	32.00	40.00	73.25
Nov. 17	18.50	12.30	9.75	90.00	17.00	32.00	40.00	73.25
Nov. 16	18.50	12.30	9.75	92.00	17.00	32.00	40.00	73.25
Nov. 15	18.50	12.55	9.75	92.50	17.00	32.00	40.00	73.25
Nov. 14	18.50	12.60	9.75	92.00	17.00	32.00	40.00	73.25
Nov. 12	18.50	12.60	9.75-10.00	93.50	17.00	32.00	40.00	73.25
Nov. 10	18.50	12.60	9.75-10.00	93.50	17.00	32.00	40.00	73.25
Nov. 9	18.50	12.80	10.00	94.50	17.00	32.00	40.00	73.25
Nov. 7-8	18.50	12.80	9.75	94.50	17.00	32.00	40.00	73.25
Nov. 3-5	18.50	12.80	9.75	94.00	17.00	32.00	40.00	73.25
Nov. 1-2	17.625	12.80	9.75	94.00	17.00	32.00	40.00	73.25
Oct. Avg.	17.625	13.242	9.317	95.505	17.00	32.00	40.00	73.25

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del, New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked, Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 28.84c; oval 28.34c; cast 26.87c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.25c; over 250 lb, 24.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00; under 100 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbls, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 111.00c, 500 to 999 lb, 111.50c; 200 to 499 lb 112.00c; less than 200 lb, 113.50c; ball, 1000 lb and over, 113.25c; 500 to 999 lb, 113.75c; 200 to 499 lb. 114.25c; less than 200 lb, 115.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 67.9c; 100 or 300 lb drums only, 100 to 500 lb, 59.7c; 600 to 1900 lb, 57.3c; 2000 to 9900 lb, 55.5c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb 59.7c; 600 to 1900 lb, 57.3c; 2000 to 9900 lb, 55.5c; 10,000 lb and over, 54.4c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 38.00c, f.o.b. Niagara Falls, N. Y.; 40.50c, f.o.b. Cleveland; 39.25c, del., Detroit and Philadelphia.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb 96.00c; more than 2000 lb, 94.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 83.00c; 100 lb kegs 84.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	15.50	15.50	14.75
Yellow brass	12.50	12.25	11.37½
Commercial Bronze			
95%	14.50	14.25	13.75
90%	14.25	14.00	13.50
Red brass			
85%	14.00	13.75	13.25
80%	13.62½	13.37½	12.87½
Best Quality (71-80%)	13.37½	13.12½	12.62½
Muntz Metal	11.50	11.25	10.75
Nickel, silver, 10%	14.50	14.25	7.25
Phos. bronze, A	16.75	16.50	15.50
Naval brass	12.00	11.75	11.25
Manganese bronze	12.00	11.75	11.12½

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 15.00, No. 2 copper 14.00; light copper 13.00; composition red brass 13.00; radiators 10.00; heavy yellow brass 10.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 15.00; No. 2 copper 14.00; light copper 13.00; refinery brass (60% copper) per dry copper content 13.25; radiators 9.50.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 13.50-13.75; No. 2 12.50-12.75; light copper 11.50-11.75; No. 1 composition red brass 11.25-11.50; No. 1 composition turnings 10.75-11.00; mixed brass turnings 6.75-7.00; new brass clippings 10.50-11.00; No. 1 brass rod turnings 9.25-9.50; light brass 6.50-6.75; heavy yellow brass 7.75-8.00; new brass rod ends 9.75-10.00; auto radiators, unsweated 8.75-9.00; cocks and faucets, 9.25-9.50; brass pipe 9.75-10.00.

Lead: Heavy 9.50-9.75, battery plates 5.00-5.25; linotype and stereotype 10.00-10.25; electrotype 9.00-9.25; mixed babbitt 9.75-10.00.

Zinc: Old zinc 4.25-4.75; new die cast scrap 4.00-4.50; old die cast scrap 3.00-3.25.

Tin: No. 1 pewter 48.00-50.00, block tin pipe 70.00-72.00, No. 1 babbitt 36.00-38.00.

Aluminum: Clippings 2S 10.50-11.00; old sheets 7.50-8.00, crankcase 7.50-8.00, borings and turnings 3.00-3.50.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Nov. 23, 1949; gross tons except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Nov. 23	$29.83
Nov. 17	30.00
Oct. 1949	26.71
Nov. 1948	43.25
Nov. 1944	16.40

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	*$33.00-34.00*
No. 2 Heavy Melt.	*31.00**
No. 1 Busheling	*33.00**
No. 1 Bundles	*33.00-34.00*
No. 2 Bundles	*27.00**
No. 3 Bundles	*25.00**
Heavy Turnings	24.50-25.00
Machine Shop Turnings	22.50-23.00†
Mixed Borings, Turnings	23.50-24.00
Short Shovel Turnings.	25.00-26.00
Cast Iron Borings	22.50-23.00
Low Phos. Steel	35.50-36.50

Cast Iron Grades*

No. 1 Cupola Cast	37.00-38.00
No. 1 Machinery Cast.	39.00-40.00
Charging Box Cast	31.00-32.00
Heavy Breakable Cast.	28.00-29.00

Railroad Scrap*

No. 1 R.R. Heavy Melt.	33.50-34.00
Axles	36.00-37.00
Rails, Random Length.	35.00-36.00
Rails, 2 ft and under	39.00-40.00
Rails, 18 in. and under	40.00-41.00
Railroad Specialties	33.00-34.00
Angles, Splice Bars	32.50-33.50

* Nominal.
† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$30.00-30.50
No. 2 Heavy Melt. Steel	30.00-30.50
No. 1 Busheling	30.00-30.50
No. 1 Bundles	30.00-30.50
No. 2 Bundles	23.50
Machine Shop Turnings	*19.00-20.00*
Mixed Borings, Turnings	20.00†
Short Shovel Turnings.	20.00†
Cast Iron Borings	20.00†
Bar Crops and Plate	32.00-32.50
Punchings & Plate Scrap	32.00-32.50
Cut Structurals	32.00-32.50

† Nominal.

Cast Iron Grades

No. 1 Cupola	44.00-45.00
Charging Box Cast	37.00-38.00
Stove Plate	38.00-39.00
Heavy Breakable Cast.	35.00-36.00
Unstripped Motor Blocks	32.50-33.50
Brake Shoes	31.00-32.00
Clean Auto Cast	45.00-46.00
No. 1 Wheels	39.00-40.00
Burnt Cast	33.00-34.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	33.00-34.00
R.R. Malleable	38.50-39.00
Rails, 3 ft and under	43.00-44.00
Rails, 18 in. and under	44.00-45.00
Rails, Random Lengths	38.00-39.00
Cast Steel	35.00-36.00
Railroad Specialties	35.00-36.00
Uncut Tires	35.00-36.00
Angles, Splice Bars	41.00-42.00

VALLEY

No. 1 Heavy Melt. Steel	$32.50-33.00
No. 2 Heavy Melt. Steel	30.50-31.00
No. 1 Bundles	32.50-33.00
No. 2 Bundles	25.00-25.50
Machine Shop Turnings	22.50-23.00
Short Shovel Turnings.	24.50-25.00
Cast Iron Borings	23.50-24.00
Low Phos.	31.00-31.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	33.00-34.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$26.00-27.00
No. 2 Heavy Melt. Steel	24.50
No. 1 Busheling	24.50
No. 1 Bundles	*27.00*
No. 2 Bundles	23.50
Machine Shop Turnings	17.00-18.00
Short Shovel Turnings	*19.00*
Mixed Borings, Turnings	*17.00*
Bar Crop and Plate	*28.00-29.00*
Punchings & Plate Scrap	*28.00-29.00*
Cut Structurals	*28.00*
Elec. Furnace Bundles	*27.00-28.00*
Heavy Turnings	26.00-27.00
No. 1 Chemical Borings	*28.00-29.00*

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
No. 1 Machinery Cast.	38.00-39.00
Charging Box Cast	35.00-36.00
Heavy Breakable Cast.	35.00-36.00
Unstripped Motor Blocks	30.00
Clean Auto Cast	38.00-39.00
No. 1 Wheels	38.00-39.00
Malleable	39.00

CINCINNATI

No. 1 Heavy Melt. Steel	$30.00
No. 2 Heavy Melt. Steel	27.00
No. 1 Busheling	29.00
No. 1 Bundles	30.00
No. 2 Bundles	24.00
Machine Shop Turnings	17.00
Short Shovel Turnings	20.00
Mixed Borings, Turnings	18.00
Cast Iron Borings	20.00

Cast Iron Grades

No. 1 Cupola Cast	42.00
Charging Box Cast	33.00
Heavy Breakable Cast.	36.00
Stove Plate	32.00
Unstripped Motor Blocks	22.00
Brake Shoes	24.00
Clean Auto Cast	42.00
Drop Broken Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00
R.R. Malleable	35.00
Rails, Rerolling	40.00
Rails, Random Length.	37.00
Rails, 18 in. and under	45.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	*$25.00-26.00*
No. 1 Bundles	*29.00-30.00*
No. 2 Bundles	*25.00-26.00*
No. 1 Busheling	*28.00-30.00*
Machine Shop Turnings	*19.00-20.00*
Mixed Borings, Turnings	*19.00-20.00*
Short Shovel Turnings	*21.00-22.00*
Cast Iron Borings	*21.00-22.00*
Punchings & Plate Scrap	*28.00-30.00*

Cast Iron Grades

No. 1 Cupola Cast	*36.00-37.00*
Heavy Breakable Cast.	*32.00-33.00*
Clean Auto Cast	*36.00-37.00*

BUFFALO

No. 1 Heavy Melt. Steel	$29.50-30.00
No. 2 Heavy Melt. Steel	27.50-28.00
No. 1 Bushelings	27.50-28.00
No. 1 Bundles	28.50-29.00
No. 2 Bundles	25.50-26.00
Machine Shop Turnings	20.00-20.50
Mixed Borings, Turnings	21.00-21.50
Cast Iron Borings	21.00-21.50
Short Shovelings	22.50-23.00
Low Phos.	31.50-32.00

Cast Iron Grades

No. 1 Machinery	37.50-38.00
No. 1 Cupola	36.50-37.00
Mixed Yard	35.50-36.00
Malleable	34.50-35.00

Railroad Scrap

Rails, 2 ft. and under.	38.00-39.00
Scrap rails	35.00-36.00
Specialties	35.00-36.00
No. 1 car wheels	36.00-37.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$23.00-24.00
No. 2 Heavy Melt. Steel	20.00-21.00
No. 1 Busheling	20.00-21.00
No. 1 Bundles	23.00-24.00
No. 2 Bundles	19.00
Machine Shop Turnings	11.00-12.00
Mixed Borings, Turnings	11.00-12.00
Short Shovel Turnings.	11.00-12.00
Punchings & Plate Scrap	23.00-24.00
Cut Structurals	23.00-24.00
Elec. Furnace Bundles.	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	29.00-30.00
No. 1 Machinery	31.00-32.00
Charging Box Cast	25.00-26.00
Heavy Breakable	25.00-26.00
Unstripped Motor Blocks	26.00
Malleable	36.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$21.00-22.00
No. 2 Heavy Melt. Steel	18.50-19.00
No. 1 Bundles	21.00-22.00
No. 1 Busheling	18.50-19.00
Machine Shop Turnings	13.00-13.50
Mixed Borings, Turnings	13.00-13.50
Short Shovel Turnings.	15.00-16.00
Bar Crops and Plate	23.00-24.00
Punchings & Plate Scrap	23.00-24.00
Chemical Borings	19.00-19.50

Cast Iron Grades

No. 1 Cupola Cast	30.00-31.00
Mixed Cast	27.00-28.00
Heavy Breakable Cast.	28.00-29.00
Stove Plate	24.00-25.00
Unstripped Motor Blocks	20.00-21.00

CHICAGO

No. 1 Heavy Melt. Steel	*$29.00-30.00*
No. 2 Heavy Melt. Steel	*26.00-27.00*
No. 1 Bundles	*29.00-30.00*
No. 2 Bundles	*24.00-25.00*
No. 3 Bundles	*16.00-17.00**
Machine Shop Turnings	21.00-22.00
Mixed Borings, Turnings	21.00-22.00
Short Shovel Turnings.	22.00-23.00
Cast Iron Borings	20.00-21.00
Bar Crops and Plate	*31.50-32.50*
Punchings	*31.50-32.50*
Elec. Furnace Bundles.	29.00-30.00
Heavy Turnings	24.00-25.00
Cut Structurals	30.00-31.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-43.00
Clean Auto Cast	42.00-43.00
No. 1 Wheels	34.50-35.50
Stove Plate	33.00-34.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	*32.00-33.00**
Malleable	37.00-38.00
Rails, Rerolling	44.00-45.00
Rails, Random Lengths	39.00-40.00
Rails, 2 ft. and under.	42.00-43.00
Rails, 18 in. and under	43.00-44.00
Railroad Specialties	35.00-36.00
Angles, Splice Bars	36.00-37.00

* Nominal.

BIRMINGHAM

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	24.50
No. 1 Busheling	24.00
No. 2 Bundles	22.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings.	19.00
Cast Iron Borings	18.00
Bar Crops and Plate	30.00
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast	34.00-35.00
Stove Plate	28.00-30.00
No. 1 Wheels	23.00-24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.00
R. R. Malleable	nominal
Rails, Rerolling	37.00
Rails 3 ft. and under	25.00-26.00
Angles and Splice Bars	31.00-33.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$31.00-32.00
No. 2 Heavy Melt. Steel	26.00-27.00
Machine Shop Turnings	19.00-20.00
Short Shovel Turnings	*22.00-23.00*

Cast Iron Grades

No. 1 Cupola Cast	37.00-38.00
Charging Box Cast	*31.00-32.00*
Heavy Breakable Cast.	*28.00-29.00*
Brake Shoes	32.00-33.00
Clean Auto Cast	40.00-42.00
Burnt Cast	32.00-33.00

Railroad Scrap

R.R. Malleable	31.00-32.00
Rails, Rerolling	40.00-42.00
Rails, Random Lengths	*37.00-38.00*
Rails, 3 ft. and under	*39.00-40.00*
Uncut Tires	29.00-30.00
Angles, Splice Bars	37.00-38.00
Railroad Specialties	33.00-34.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	15.00
Nos. 1 & 2 Bundles	13.00

Cast Iron Grades

No. 1 Cupola Cast	23.00-25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Wheels	17.00
Rails, Random Lengths	17.00

SEATTLE

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling	15.50
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	13.00
Mixed Borings, Turnings	13.00
Punchings & Plate Scrap	22.00
Cut Structurals	22.00
Elec. Furnace Bundles.	23.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-27.50
Heavy Breakable Cast.	20.00
Stove Plate	20.00
Unstripped Motor Blocks	18.00
Malleable	20.00
Brake Shoes	18.00
Clean Auto Cast	25.00
No. 1 Wheels	25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	19.00
Railroad Malleable	25.00
Rails, Random Lengths	19.00
Angles and Splice Bars	19.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	24.00
Electric Furnace Bundles	26.00

Cast Iron Grades

No. 1 Cupola Cast	$32.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	32.00

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$24.00
No. 1 Bundles	24.00
Mechanical Bundles	22.00
Mixed Steel Scrap	20.00
Mixed Borings, Turnings	18.00
Rails, Remelting	24.00
Rails, Rerolling	27.00
Busheling	18.00
Bushelings new factory, prep'd	22.00
Bushelings new factory, unprep'd	17.00
Short Steel Turnings	18.00

Cast Iron Grades*

Cast	40.00-43.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

SCRAP—AT THE TURN OF THE CENTURY

In the late 90's a new process was developed in Eastern Pennsylvania for manufacturing wrought iron bars by reheating prepared scrap. Because large capital investments were not needed by these operators, the box pile method, as it was called, became an important phase of the mill operations of the time. This method entailed cutting scrap, piling and wiring it in small packs, and bringing it to a white heat. The heated box piles were passed through rollers until the desired shape was reached. A few manufacturers still produce flats, rounds, squares and reinforcing bars by the box pile method. At the turn of the century, Luria Brothers & Company, Inc. furnished scrap for the specific need of that day. Today, we have the expanded facilities and organization to supply the current requirements of mills, foundries, chemical plants and other consumers of scrap—regardless of amount or specification.

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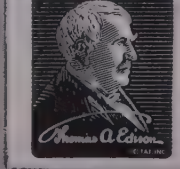

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Sheets Strip . . .

Sheet and Strip Prices, Page 103 & 104 & 10

Cleveland—Tight supply condition well into 1950 loom in sheets and strip. Consumers appear more optimistic on the supply outlook than do producers, anticipating fairly comfortable conditions by mid-first-quarter. The mills, however, report order backlogs are so heavy they will have little new tonnage to offer before second quarter, if then. Republic Steel Corp., is booked solidly through first half on cold-rolled sheets and strip. It is allocating tonnage to its various district offices based upon the sales pattern established during 1948-49. While some duplicated tonnage may wash out, thus easing the burden on the mills, producers have screened orders carefully with the result it is unlikely duplicate orders will approximate anything like the volume experienced during the period of acute shortage in 1948 and early 1949. Material is flowing from the mills in steadily rising volume, but prestrike finished product flow is not expected to be attained until some time in December.

Strike of long-distance truckers interfered with the movement of steel from mills last week to some extent. However, with numerous trucking firms quickly coming to terms with the union it was expected scheduled steel hauls would not be greatly delayed.

Sharon, Pa.—Sharon Steel Corp. increased hot-rolled strip, 6-in. and under, $5 a ton to $3.50 f.o.b. mill, effective Nov. 22.

Philadelphia—Sheet metal fabricators are pressing for deliveries while jobbers are endeavoring to bring inventories into some semblance of balance. Pressure so far has shown little abatement in any direction. Producers are keeping a close eye on developments in the automotive industry, especially as they shape up over the next several weeks.

Mills generally are practically booked up for the first quarter on carbon grades and in some cases, where they are willing to commit themselves, well into the second quarter. One leading eastern producer has virtually sold out for the first quarter on hot sheets, but has not opened books beyond February on cold sheets.

New York—Most sheet sellers are booked for first quarter on carbon grades. A few are accepting orders for second quarter and building up backlogs through May. One midwestern producer, who recently entered labor agreements covering three units down since Oct. 1, is expected to open books this week on carbon grades for first quarter.

Boston—Flat-rolled steel shipments are heavy and most consumers are getting inventories in better balance with indications production schedules will be less seriously affected than had been predicted. New buying has eased on some products and more extended volume is likely to be subject to readjustments next quarter. Balancing off in delivery schedules among mills is gradually developing. First quarter mill schedules are filled and fair volume is being booked for second, though some producers are taking nothing beyond May. Inquiry

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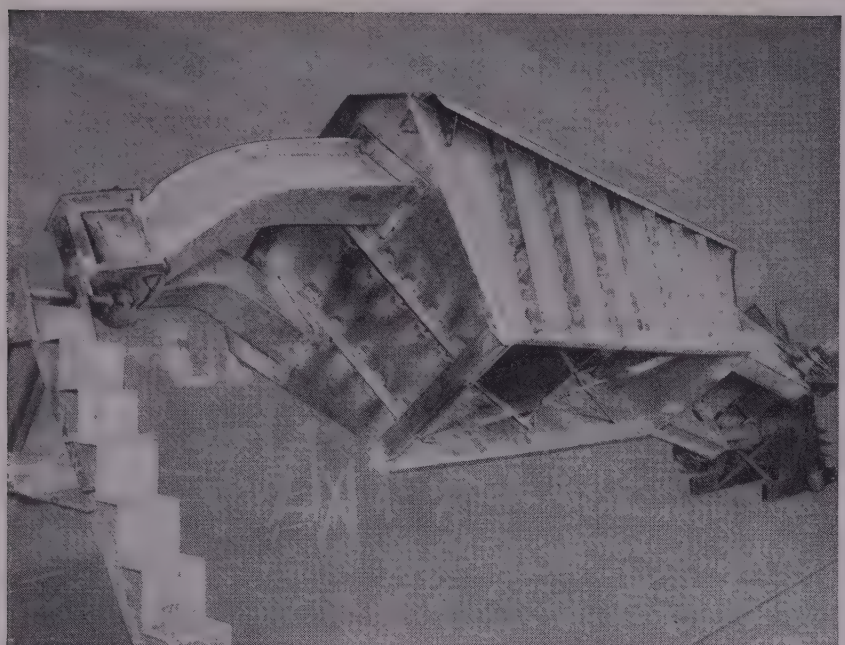

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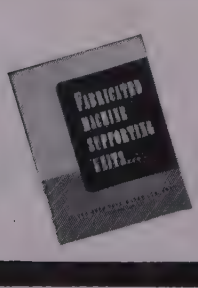

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for stainless strip is heavier, notab from one shipyard.

Pittsburgh—Sheet and strip ou put since termination of the stri has been considerably greater tha predicted. Irvin Works of Carnegi Illinois Steel Corp. has established record on its No. 2 five-stand co reduction mill. Check among meta working concerns indicates shipmen on old orders already have been mad in substantial quantities, but not a cold-rolled strip and stainless ste producers have reached an agreemer with the union. Mill order backlog assure capacity output through fir quarter.

Cincinnati—Pressure for sheets a sures capacity operations at mills i this district. District producers ar ready to open books formally fo first quarter, but curtailment in ou put by the strikes has complicate the delivery situation and has pre vented a clear estimate of the carry over.

Chicago—Some purchasing men i the Midwest are wondering whethe they had acted too hastily when, i midsummer, they cold-shoulder steel salesmen. They are again wear ing a path to steel sales office Stocks of cold-rolled and galvanize sheets never became completely ade quate, but were moving into balanc before the strike which set the tim table back perhaps six months. Ther is a good chance that sheet and stri capacity here will be fully booke but that material will not be too dif ficult to obtain elsewhere, the onl premium being the extra freigh cost. This possibility still appear remote for galvanized sheets, ver few users having been adequatel supplied before the strike, but seem quite distinct for hot-rolled and some what less so for cold-rolled. Scat tered producers are contemplating price increase on galvanized.

San Francisco—Fabricators are at tempting to replenish inventories. In dications are supplies of flat-rolle products will be tight the next severa months. Cold-rolled and galvanize sheets are in greatest demand.

Semifinished Steel . . .

Semifinished Prices, Page 103

Sharon, Pa.—Sharon Steel Corp raised the price on carbon rerollin billets, blooms and slabs $5 to $5 and on sheet bars $5 to $57, effectiv Nov. 22.

Tin Plate . . .

Tin Plate Prices, Page 104

Pittsburgh—Distribution of tin mil products will be controlled closel through first quarter. Consumers stocks were reduced throughout th strike, although no significant curtail ment in operations among can com panies occurred. Producers shippe substantial tonnages from mill ware house stocks immediately upon ter mination of the strike and still addi tional tonnage was soon availabl upon completion of finishing opera tions of orders in process at time o the shutdown. Full tin plate oper ating schedules are held likely at th close of this week.

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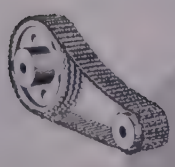

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SP-159

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 103

Cleveland—Reinforcing bar deman last week was curtailed by the col weather which swept in over thi area. Few projects of consequenc are pending and sellers anticipat limited volume until better weathe returns.

Los Angeles—Demand for reinforc ing bars is sustained, although de liveries are available within one t two weeks. Public works and resi dential jobs dominate building here

Seattle—Decline in new steel order is reflected in operations of rollin mills. Bethlehem Pacific Coast Stee Corp., Seattle, is using only two o five furnaces. Northwest Steel Roll ing Mills, Inc., Seattle, is rolling only four days a week, although furnace are at full capacity. Oregon Stee Mills, Portland, is also on a four-da rolling schedule.

Steel Bars . . .

Bar Prices, Page 103

Pittsburgh—Carbon and alloy mer chant bar output at near capacity i expected at least through January Few bar consumers were forced t curtail operations sharply due to lo inventories. Unusually swift resump tion of finishing mill operations ease the threat of a critical supply situ ation, with the result full metalwork ing schedules will be achieved earlie than predicted. A mixed inventory situation is noted among consumer of cold-finished bars, some reportin idle equipment due to depleted stock while others are reducing inventory Columbia Steel & Shafting Co. i scheduled to resume operations thi week.

New York—Carbon bar buyers are building working inventories, al though some are willing to coast a bit insofar as new orders are con cerned and await shipments against orders already placed.

Realization that most producer can ship against new orders within a few weeks has caused consumer to ease pressure noted a couple week ago.

Boston—Orders for hot-rolled car bon bars are being taken for January shipment with new demand slightl slower. Availability of cold-finished bars varies with size and grade. Or some, stock shipment is possible, bu bars to be processed take three t four weeks and heat-treated stock i promised for late January and early February.

Philadelphia—Carbon bar sales are leveling off, as consumers experience a steadily increasing flow from the mills. They are less concerned over prospects for getting additional ton nage, as mill promises now average around four to five weeks.

Cleveland—No acute shortages are anticipated in carbon and alloy bars Producers' order backlogs are sub stantial, but pressure for deliveries from consumers is not comparable with that for sheet and strip.

San Francisco—Supplies of bars are increasingly plentiful. During the strike, inventories did not dip as low as some other products. Buying pressure is not insistent.

Courtesy Hyscore Arms Co., Brooklyn, N.Y.

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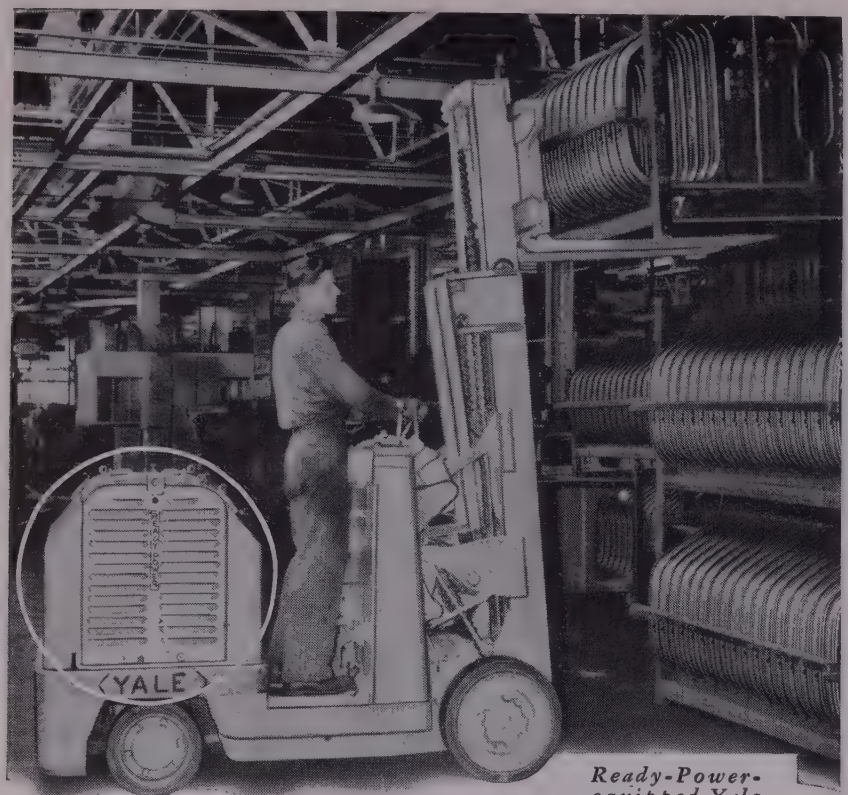

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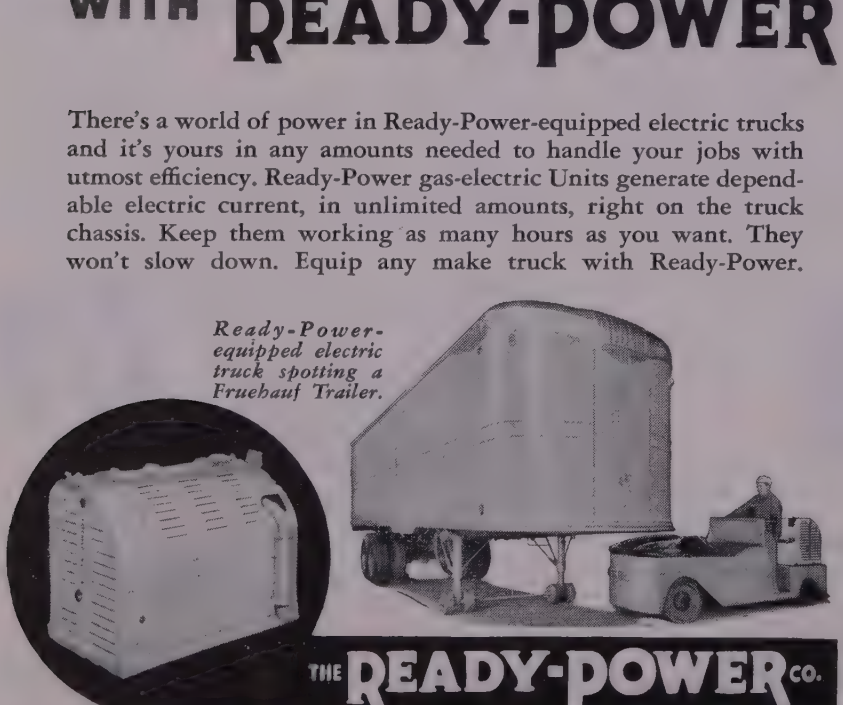

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Structural Shapes . . .

Structural Shape Prices, Page 103

Boston—Except for public work notably bridges, new volume of structural steel being estimated is light with district fabricating shop backlogs down to two months and less. This is reflected in demand for plain material with standard shapes available in two or three weeks.

Pittsburgh—Structural fabricating activity is improved. Substantial tonnages were booked early last week. In most instances, order backlogs extend 3 to 4 months, dependent on type of project. As a result, a number of bridge and plant expansion projects are being delayed.

San Francisco—New industrial construction is picking up. Structural supplies are fairly adequate. Users are starting to replace items depleted during the strike.

Seattle—Fabricating plants are reducing backlogs because they are booking only small tonnages. Inventories of plain materials are sufficient to tide plants over until eastern mills resume normal shipments.

Plates . . .

Plate Prices, Page 103

New York—Plate buying is limited but steady. Mills, which until recently had been closed by strikes, are operating at a fairly good rate and expect to be caught up on arrearages soon, after which, unless there is some unexpected spurt in demand they will again restrict output. Most producers can accept tonnage for shipment before yearend.

Boston—Demand for plates is mostly in light gages required for small tanks. Some decline in orders for underground type tanks is noted. Business is spotty, some mills in position to deliver this year. An increasing volume of plates in small lots is being shipped by truck from eastern Pennsylvania. Plate fabricators are carrying limited inventories depending on prompt shipments.

Philadelphia—With district demand slack, some plate producers are reaching out for business through absorption of at least a certain portion of the freight. Most can still make delivery promises of three to five weeks. Demand principally is from jobbers and fabricators of light tanks. One district railroad is inquiring for a modest tonnage of plates and shapes for car repairs, the first semblance of demand of this character in some time. District plate production is the highest since well before the strike although a leveling off is expected before the end of the year.

Pittsburgh—Plate deliveries are not extended nearly so far as other flat-rolled products. Tank requirements have eased and relatively little improvement is noted in barge construction needs. Sellers anticipate better first quarter orders from railroad car builders. Fairly prompt delivery is available on floor plates, one mill having openings in December schedules.

Seattle—Plate shops report the usual seasonal decline in new business. Inventories, except for special orders, are ample for current needs.

Story of the two "missing days"

Back in 1910, when a man left his home on Monday morning, he had a 58-hour work week before him.

But over the years—as workers, business and manufacturing methods all got more efficient—it took less and less working time to produce goods of all kinds.

The result is that today the average work week has been cut to 40 hours. 18 hours—more than two whole working days—are missing from a man's work week. They've been transferred to the man himself—to use for leisure time!

But that's not the whole story. Back in 1910, the average household earned about $2400 for its year's work. Today, for a lot less work, it earns nearly *twice* that! And in dollars of the same purchasing power, too.

That's the American economic system at work.

This system has some faults—such as ups and downs in prices and jobs. And everybody in this country, except a small group of eccentrics and communists, is working to correct them.

But just remember this: If you want to earn still more money—if you want to work still shorter hours—the only way to do it is to make the American system work even *better*. And that means that every man, every business, every machine has got to produce more and more for every hour they work—just as they've *been* doing since 1910. And if they do, the gains can be shared by everyone.

All of us in this country *want* the system to work better. And if all of us work together—you can be dead sure it *will*.

The Better We Produce—The Better We Live

Approved for the PUBLIC POLICY COMMITTEE of The Advertising Council by:

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PAUL G. HOFFMAN, Former President Studebaker Corporation

Like many American firms, we believe that business has a responsibility to contribute to the public welfare.
This advertisement is therefore published as a public service by:

STEEL

FREE . . . *send for this interesting booklet today!*

Approved by representatives of Management, Labor and the Public.

In words and pictures, it tells you
—How our U. S. Economic System started
—Why Americans enjoy the world's highest standard of living
—Why we take progress for granted
—How mass production began
—How we have been able to raise wages and shorten working hours
—Why the mainspring of our system is productivity
—How a still better living can be had for all

MAIL THE COUPON to Public Policy Committee, The Advertising Council, Inc., 25 West 45th Street, New York 19, New York.

NAME_____

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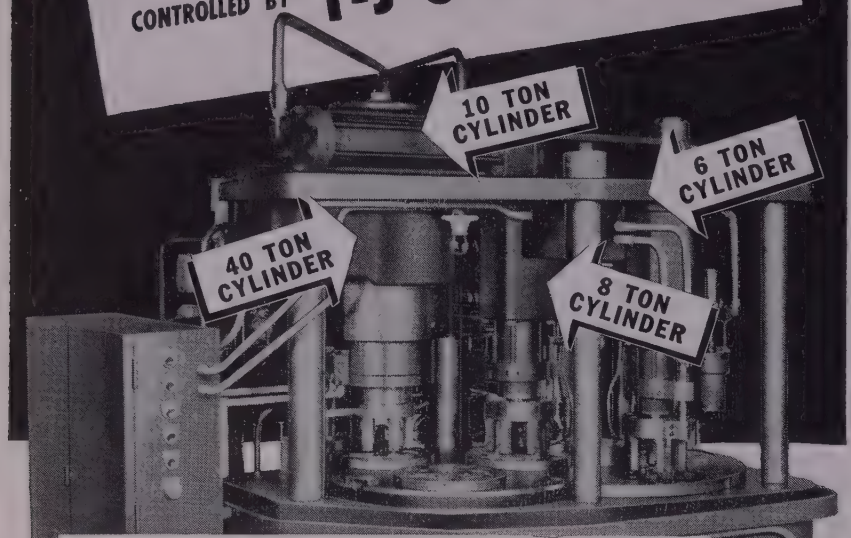
Job File No. 1949

MALLEABLE NUT PRODUCTION

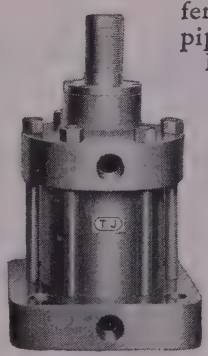
Fully Automatic

CONTROLLED BY T-J CYLINDERS



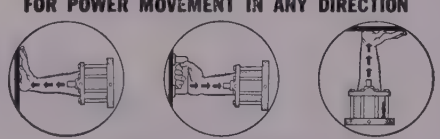
All moving parts are controlled hydraulically by T-J Cylinders—on this Malleable Nut Production Machine designed and built by Roy Hays & Associates, Rockford, Ill., for the Wagner Malleable Products Co., Decatur, Ill.

It's *fully automatic*—the operator only places nuts in stations. Nine T-J Cylinders, 40 ton to ½ ton, help complete the job of cutting off sprue, sizing, boring, facing, chamfering and threading 2,500-¾ std. pipe thread nuts per hour.



For your tough jobs of power movement — pushing, pulling or lifting—*save labor, speed production* and *cut costs* with T-J Air and Hydraulic Cylinders! Many standard sizes and styles . . . both cushioned and non-cushioned types . . . 100 lb. or 50,000 lb. Precision-built for long-life dependability. Write for latest catalogs. The Tomkins-Johnson Co., Jackson, Mich.

FOR POWER MOVEMENT IN ANY DIRECTION



100 LB. or 50.000 LB.

T-J

TOMKINS-JOHNSON

RIVITORS . AIR AND HYDRAULIC CYLINDERS . CUTTERS . CLINCHORS

Tubular Goods . . .

Tubular Goods Prices, Page 106

Los Angeles — Requirements for small diameter pipe are heavy. Fabrication of large pipe is on a substantial scale for major gas and water lines. Demand from the oil industry is receding as petroleum companies cut back output and shave prices. Cheap fuel oil is cutting into natural gas sales for industrial consumption in California.

Seattle—Interest in cast iron pipe is seasonally inactive. No sizable projects are up for bids. Agencies are covering small orders out of warehouse inventories.

Metal Powders . . .

New York — Promising demand prospects for its new steel powders are seen by executives of the Vanadium-Alloy Steel Co., Latrobe, Pa. Reports in financial circles here are to the effect the company up to Aug. 1 had sold 10,000 pounds and about 1000 pounds had been furnished for test purposes. Sixteen different compositions had been turned out up to that time, some 16 accounts had purchased small amounts of the powders and 39 others are making tests.

Wire . . .

Wire Prices, Page 105

Pittsburgh—Wire shipments over the next few months will be controlled to achieve fairest distribution, but return to formal allotments is not indicated. Some integrated mills limit order acceptances for wire rods because of their own heavy requirements. An unusually large backlog of wire rod orders for shipment to nonintegrated mills has developed. Seasonal factors should improve demand for fencing and barbed wire. Jobbers' stocks of nails in popular sizes are badly depleted. Sellers' backlogs range 2 to 3 months on manufacturers' wire items. Improved demand is noted from furniture manufacturers and screw machine interests. No let-up is indicated in automotive needs.

Boston—Mills resuming production after the strike suspension are taking first quarter orders while those who lost no production are well advanced on bookings for that period. Some fourth quarter tonnage will extend into first quarter, but mostly products requiring longer processing time.

Chicago—Not all wire mills here are fully booked on all products. At some, capacity for merchant items, with the exception of nails, is partially open until late next month at which time seasonal demand is expected to rise. Stocks of welded mesh are low, due to heavy requirements for road construction. Manufacturers' wire demand is extremely heavy.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 107

Boston—Standard Nut & Bolt Co., Valley Falls, R. I., booked an order for machine nuts and bolts for the Navy at $58,638. Springfield Armory closes Dec. 9 on 285 tons.

Iron Ore . . .

Iron Ore Prices, Page 106

Cleveland—Stocks of iron ore increased to 47,017,398 tons on Nov. 1 from 45,356,369 tons a month earlier and compared with 43,883,357 tons on Nov. 1, 1948, reports the Lake Superior Iron Ore Association. The Nov. 1 total does not include the substantial tonnages which are still in the holds of the vessels which were tied up during the strike.

Consumption dropped to only 876,792 tons in October from 5,541,187 tons in September and compared with 7,273,213 tons in October of last year.

Pig Iron . . .

Pig Iron Prices, Page 102

Pittsburgh—Unusually heavy demand for pig iron from producers of enamelware and radiation equipment has developed. Considerable improvement in orders also is noted from ingot mold interests. Foundries serving the railroad equipment field report little change in order volume, but anticipate a substantial increase next quarter.

New York—With more blast furnaces in full operation, pig iron is moving more freely into this district. Actually, orders are limited because most consumers are in comfortable supply position.

Boston—Pig iron shipments are off around 10 per cent this month compared with October. Outlook for an increase in the melt is uncertain, especially after Jan. 1 with 4 to 5 of the largest consumers.

Philadelphia—Pressure for foundry iron is definitely off, with most consumers in comfortable position and with producers able to make prompt deliveries. At present, there appears to be no particular concern among pig iron and coke buyers with regard to another coal tie up.

Buffalo—Blast furnace operations in this district jumped six points last week to 81 per cent of capacity as Hanna Furnace Co. relighted its third stack. No merchant iron is being piled in this area but a portion of current output is moving into storage.

Cleveland—Blast furnace operations in this district are rapidly getting back to normal and threat of a shortage of pig iron is vanishing. Both stacks of the American Steel & Wire Co. are in operation. Republic Steel Corp. added its fifth stack last week to the active list, while the two blast furnaces of Jones & Laughlin Steel Corp. are blowing.

Youngstown — Twenty-one blast furnaces are in operation in this district. Republic Steel has four on at Youngstown and one at Warren, Youngstown Sheet & Tube's Campbell works, two at its Brier Hill plant, and it is starting up its Hubbard stack. Five blast furnaces of Carnegie-Illinois Steel Corp. are in blast here, while Sharon Steel Corp. has a stack on at Lowellville and another at its Farrell works. Shenango Furnace Co. is operating one blast furnace and plans to start a second.

Cincinnati—Pig iron from northern and southern furnaces is moving into this district steadily, but in light volume reflecting only fair foundry melt.

"They Switched to SPEED TREAT STEEL PLATE and Cut Machining Time and Tool Costs"

Plus IMPROVING THEIR PRODUCT

CHISHOLM, BOYD & WHITE, Inc., Chicago, builders of brick and clay plant machinery were using cast alloy steel for 10' 9" long side arms for their principal product, quote the "BOYD BRICK PRESS." The cast arms were susceptible to sand holes, were difficult to machine, required more machining because they were necessarily cast oversize and additional time was required to age the parts.

They switched to Speed Treat (X1545) medium carbon, open hearth steel plate. Arms were delivered flame cut from 5½" thick plate, stress relieved. They are easy to machine and tool life was greatly increased. The "as-machined" surface facilitates final machining. With a tensile strength of 90 - 100,000 p.s.i. they excel the castings formerly used for this service.

Free machining Speed Treat is one of the Holliday cost-cutting Speed Steels. Send for Bulletin 901.

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Plants: Hammond and Indianapolis, Indiana

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Bridgeport Steel Co., Bridgeport, Conn.
Grammer, Dempsey & Hudson, Inc., Newark, New Jersey
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Horace T. Potts Co., Philadelphia—Baltimore

Scrap . . .

Scrap Prices, Page 110

Philadelphia—While prices on most grades of steel mill scrap are unchanged, the market undertone is a shade easier. District consumers are still buying lightly and some not at all. At least one consumer has 60 days supply on hand.

Nos. 1 and 2 heavy melting steel No. 2 bundles, and No. 1 busheling are unchanged; No. 1 bundles are a shade higher at $27. Short shovel turnings are now $19, mixed borings and turnings, $17. Bar crop and plate and punchings and plate scrap are $28-$29 and cut structurals $28. Electric furnace bundles are higher at $27-$28; chemical borings at $28-$29.

Pittsburgh—Upward trend continued in open-hearth scrap prices last week with sale of a representative tonnage at $34 for No. 1 heavy melting and No. 1 bundles. Considerable tonnage is still moving at $33, and the quotable range for these grades is $33-$34.

Award of railroad lists, expected momentarily, should reflect recent upward price adjustments in other scrap grades. Despite indication of near capacity steel output through most of first quarter and adverse weather conditions for collection and segregation of scrap in the offing, mills have not re-entered the scrap market for large tonnages following resumption of operations.

New York—Scrap brokers' buying prices are unchanged throughout the list. Demand for steel grades from Pittsburgh area is still brisk, although little business is developing in eastern Pennsylvania area.

Buffalo—Sale of an additional 5000 tons of steelmaking scrap was reported last week to a leading mill consumer. This transaction lifted the total tonnage moved recently to approximately 20,000 tons. Prices are up $2 per ton on these sales, injecting firmer tone into the market. Dealers, however, report no difficulty acquiring material to cover their commitments.

Cleveland—Scrap prices held unchanged last week at $30-$30.50 for No. 1 heavy melting. Prices are based on the latest reported sale, $33 Valley. Mills are well stocked. Many of them laid down substantial tonnages in yards during the steel strike, and are reluctant to make new commitments at the prices now asked before their reserves are reduced.

Cincinnati—Scrap is moving more freely to melters as mills step up operations. Reappearance of buying has strengthened the market. Prices are steady, but some dealers are holding tonnage on expectations of further increases. Demand for cast grades is dull.

Detroit—Strong dealer sentiment and prospects for greatly reduced volume of production scrap from motor plants are driving prices ahead, steel grades being up $1.50 to $2 per ton. Scattered buying for electric furnace melters is reported at prices even higher than published figures.

Chicago — Weakness developed in the scrap market at mid-week which left brokers uncertain as to future trend. Mill buying since the strike has been sparse, partly because of railroad car jams, although two mills have bought some No. 1 steel, neither purchase itself being of sufficient size to establish the market.

St. Louis—Heavy breakable and charging box cast dropped $3 last week on a moderate purchase by Laclede Steel Co. Two weeks ago No. 2 melting steel went at $27. Quotations on short and random length rails are up $1. Brokers think a decline likely next week when Missouri Pacific offers 50 cars of No. 1 melting. Sheffield Steel, which usually competes for railroad scrap, is currently out of the market.

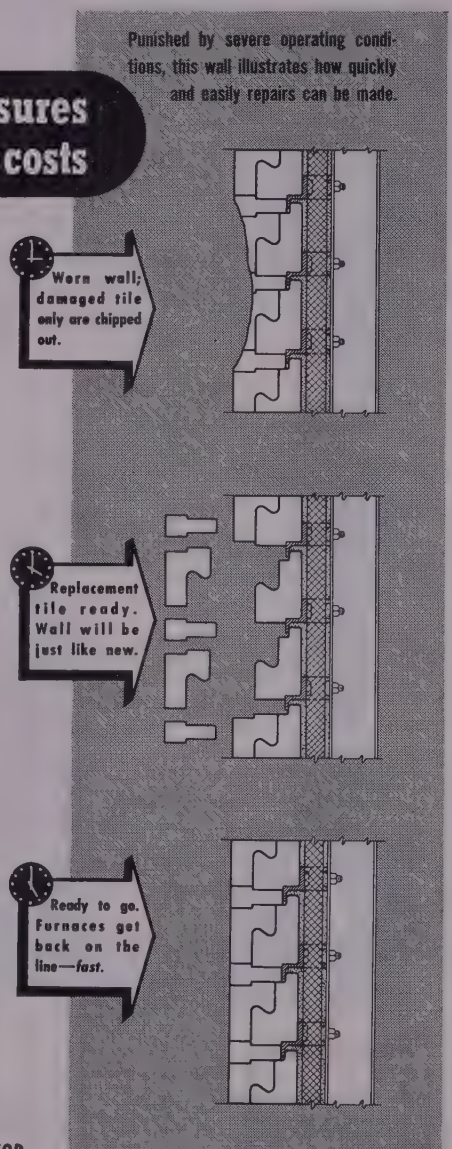
Los Angeles—Mill buying of steelmaking scrap is steady. Dealers have been able to fill post-strike requirements without difficulty. Prices are unchanged, but undertone has softened in cupola cast.

San Francisco—Mills have not entered the scrap market for new supplies and prices are steady. Scrap dealers had expected the end of the steel strike to signal increased buying and firmer prices. Mill inventories are adequate.

Seattle—Receipts of steel scrap by the mills are in excess of consumption. In order to keep shipments in line with current needs, leading buyers anticipate temporary withdrawal from the market. No intention of cutting the going price of $18 is indicated.

B-L furnace enclosures lower maintenance costs

Punished by severe operating conditions, this wall illustrates how quickly and easily repairs can be made.


Worn wall; damaged tile only are chipped out.
Replacement tile ready. Wall will be just like new.
Ready to go. Furnaces get back on the line—fast.

• Unit-suspended construction provides top operating efficiency and lower maintenance costs. Here's how:

By cutting the size of the repair job. *Unit* repairs are possible; only worn tile need be replaced, adjacent areas are untouched. Result: less handling, labor, and tile replacement.

By reducing the time spent for repairs. Furnaces get back on the line—fast.

Unit-suspension avoids loading tile on top of tile and resulting cumulative stresses and strains. Mechanical spalling caused by pinching, buckling and other thermal movements is eliminated.

Specify B-L furnace enclosures for all kinds of industrial heat installations.

Capsule comments to complete our story:

1. Walls and arches feature "built in" stability; any portion can be removed for replacement without weakening adjacent areas. Design provides for thermal expansion.

2. Construction is air tight; heat losses are reduced. Maximum efficiency can be maintained and fuel used to full advantage.

3. Unit suspension permits flexible design, eliminates cumulative loading.

4. B-L engineers co-ordinate enclosure requirements with problems of temperatures, types of firing equipment, and slagging and erosion possibilities.

PIONEERS OF SUSPENDED CONSTRUCTION FOR INDUSTRIAL FURNACE ENCLOSURES . . .

BIGELOW LIPTAK Corporation

BIGELOW-LIPTAK

Unit-Suspended Walls + Arches

SUBSIDIARY OF A. P. GREEN FIRE BRICK CO.

CURTIS BUILDING • DETROIT 2, MICHIGAN

IN CANADA

BIGELOW-LIPTAK OF CANADA, LTD., TORONTO, ONTARIO

Warehouse . . .

Warehouse Prices, Page 107

Pittsburgh—Unusually prompt resumption of finishing mill operations has put some distributors "back in business," on such items as wide flange beams, cold-rolled and galvanized sheets, much sooner than anticipated. Demand for standard structural items and plates has been relatively light since the strike's end. Most distributors have reduced top-heavy stocks of stainless, cold-finished bars and alloy merchant bars in addition to odd-size slow-moving items in other product classifications.

Philadelphia—While business is off this month, jobbers say that if it gets no worse than at present they still will be having a comfortable operation. Orders are fairly good and in some lines, especially in light flat products, business is limited only by lack of stocks. Distributors believe that they will be unable to bring sheet inventories into balance before late in the first quarter at the earliest.

Cleveland — District warehouses continue to book new business in substantial volume, but pressure is definitely off demand. With practically all mills again in production, consumers are resuming normal buying policies. Distributors are busy replenishing depleted stocks of flat-rolled products, but are not being given preferential treatment. Warehouse stocks of bars are fair, but some sellers' inventories are not too well balanced. First quarter is expected to be pretty well along before market conditions are normal.

Cincinnati—Demand for warehouse steel is strong with buyers shopping around for fast-moving items. Mill shipments are not adequate yet to cover needs of the district, particularly in plates, sheets and structurals.

Chicago — Popular sizes of sheets and bars are still unobtainable at most warehouses and with most mills adhering to rigid schedules, there seems to be little basis for encouragement that these products will be replaced soon. With warehouse stocks so badly depleted and consumers unable to get production requirements from mills, shipments have undergone a sharp decline. Immediate rush for warehouse steel has been enough in most cases that off-grade material also moved into consumption.

San Francisco—Jobbers' volume is holding up as consumers try to replenish stocks. Warehouses are ordering liberally to build up supplies of scarce items.

Seattle — Jobbing houses report business has dropped. During the steel strike, buying was comparatively heavy as consumers sought to protect themselves against a steel famine. Nails and pipe, particularly the smaller commercial sizes, are scarce; galvanized sheets are the chief bottleneck.

STRUCTURAL SHAPES . . .

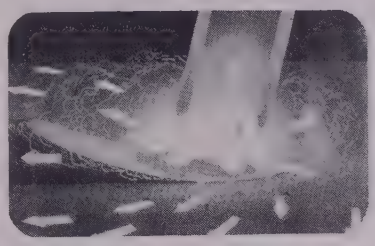
STRUCTURAL STEEL PLACED

400 tons, office, Phoenix Insurance Co., 30 Trinity St., Hartford, Conn., through Robert Glenn, general contractor, to Harris Structural Steel Co., that city.

250 tons, rug factory, A & H Karagheusian Inc., Freehold, N. J., through Turner Con-

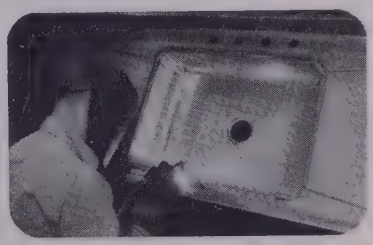
How can you cut costs with ARC WELDING?

See this film and find out!



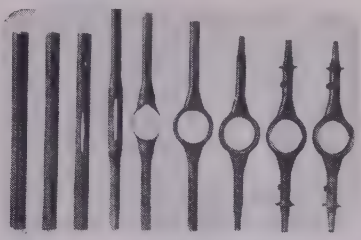
1. "ARC WELDING AT WORK", a 16mm full-color motion picture produced by General Electric, has a message for every cost-conscious executive who may be overlooking opportunities for arc welding in his own plant. A vivid animated treatment (above)...

2...makes the technical parts of this film highly palatable. New uses for arc welding are suggested throughout. Welded building construction, for example (above) is shown to be efficient and economical. And as outdoor pressure vessels and piping . . .

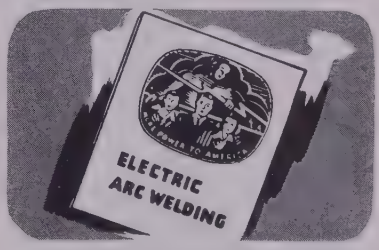


3...become larger and more complicated the value of modern arc welding becomes more and more evident. In fabricating a consumer product like kitchen sinks (above), the film shows how high-quality welding adds extra eye appeal and salability.

4. As exemplified in this tubing machine (above) automatic arc welding is shown to offer almost limitless opportunities. Here, precise heat control is the big factor. Also, arc welding provides highly ductile joints, a fabricating requirement for . . .



5...this automotive rear-axle housing (above). These welded joints withstand ten severe stretching and swaging operations, with no sign of failure! Because we believe you can profit from a wider knowledge of arc welding, let us send you this . . .



6. ARC WELDING MANUAL . . . FREE! It has all the data you need to make an intelligent decision on this vital subject. [The complete program consists of a 30-minute film, manual and "highlights" booklets.] MAIL THE COUPON TODAY!

FREE *to business management!*

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☐ Please send me a complimentary copy of the G-E Arc Welding Manual (GES-3491). (Extra copies at regular manual price—$1.25.)

☐ I'd like to borrow a 16mm print of the color film from my nearest G-E office.

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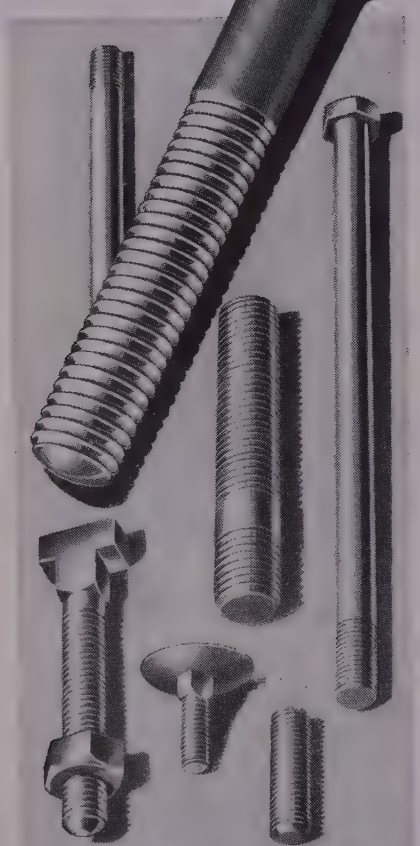
EYE BOLTS

Accurately made in sizes ¼" and larger, or to your specifications, Pawtucket Eye Bolts are the answer to many assembly problems. Exclusive production methods keep costs low — assure uniform Class 3 Fit.



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"THE BOLT MAN"
MANUFACTURING COMPANY
327 Pine Street · Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.

struction Co., Philadelphia, to Bethlehem Contracting Co., Bethlehem, Pa.

130 tons, St. Joseph's annex, Sacred Heart Parochial school, Bronx, New York, to Grand Iron Works Inc., that city.

STRUCTURAL STEEL PENDING

1000 tons, laboratory, Langley Field, Virginia; bids Dec. 20.

900 tons, state bridge, Monocacy river, Maryland; bids closed.

250 tons, state bridge, Frederic county, Maryland; bids closed Nov. 22.

250 tons, power house, Central Maine Power Co., Caribou, Me.; pending.

150 tons, synthetics building, Sharp & Dohme, West Point, Pa.: bids Nov. 28. This is in addition to 735 tons recently noted as placed for construction at West Point.

Unstated, reconstruction of state capitol dome, Olympia, Wash., damaged by earthquake; General Construction Co., Seattle, low $126,750.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1100 tons, storm sewer, Omaha, Nebr., to United States Steel Supply Co., Chicago.

100 tons, grade separator, Dundee road, Cook county, Illinois, to United States Steel Supply Co., Chicago.

REINFORCING BARS PENDING

3100 tons, veterans hospital, Pittsburgh; bids asked.

470 tons, general office, Public Service Co., Plainfield, Ind.; bids asked.

402 tons, Pennsylvania turnpike, Westmoreland county; bids asked.

200 tons, state highway bridge, Hudson, Wis.; bids asked.

200 tons, Central Illinois Gas & Light Co., Peoria, Ill.; bids asked.

150 tons, nurses home, Spencer Hospital, Meadville, Pa.; bids asked.

105 tons, bridge project 373, Cuyahoga county, Ohio; bids asked.

Unstated, bear grotto, Woodland Park zoo, Seattle, $238,000 project; bids to Seattle park department, Dec. 7.

PLATES . . .

PLATES PLACED

1500 tons, Lucky Peak diversion tunnel, near Boise, Idaho, ½ and ¾ inch liner plate, to Olson Fabricating Co., Boise; general contract to Puget Sound Bridge & Dredging Co., Seattle, and Macco Corp., Paramount, Calif., general contractors, joint low bid $1,169,755.

100 tons, elevated steel water tank for U. S. Engineer, Walla Walla, Wash., to Chicago Bridge & Iron Co., Seattle, low $20,895.

PIPE . . .

STEEL PIPE PLACED

1275 tons, fabricated steel water pipe, Allentown, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

STEEL PIPE PENDING

Unstated, 18,000 feet 30 and 42 inch water supply mains, Maple Leaf district, alternative concrete pipe; bids to Seattle Nov. 30.

Unstated, 5310 feet 4 inch steel pipe and fittings; bids to H. O. Hutt, secretary District No. 37, Alderwood Manor, Wash., Nov. 28; R. E. Wolfe, Seattle, engineer.

RAILS, CARS . . .

CARS PENDING

Southern Pacific, 3100 new freight cars, comprising 3000 box cars, of which 1000 will be automobile box cars and 100 gondola cars contemplated; in addition this railroad plans to rebuild 900 box cars, with the program to be carried out next year at the rate of 90 cars a month.

When heavy, unwieldy weldments like these diesel crank cases can be quickly swung into any position so that every weld is made downhand—that's efficient welding!

Weldors spend more time welding—do better welding at lower cost when they work with C-F Positioners because these hand and/or power operated machines reduce positioning time to a minimum. Investigate the cost-saving advantages of C-F Positioners. They pay their way in any company.

Write for Bulletin WP24—an illustrated circular detailing the specific advantages of C-F Positioners.

CULLEN-FRIESTEDT CO.
1308 S. Kilborn Ave., Chicago 23, Ill.

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.
C-F positioned welds mean better, more economical welds

CONSTRUCTION AND ENTERPRISE

FLORIDA

ALLAHASSEE, FLA.—City, Robert Parker, mayor, plans electricity generating plant, at St. Marks; estimated cost, $5 million.

MICHIGAN

ETROIT — Herron-Zimmers Moulding Co., 3900 East Outer Drive, sustained damage amounting to $1 million in finished stock and equipment for manufacture of metal trim moldings for automotive applications, in a fire Nov. 20. The company will be out of production for 30-60 days.

ETROIT—Dyna-Weld Inc., 1426 Buhl Bldg., has been formed to manufacture welding electrodes; organizer Gordon C. Kennedy, 2430 Clifford Ave.

ETROIT—Ace Aluminum Inc., 2728 Buchanan Ave., has been incorporated by William G. Lawrason, 21035 St. Francis, Farmington.

ETROIT—Columbia Tool & Die Co., 8818 Traverse, has been formed by Gerard Moenart, 11487 College Ave., to manufacture special tools, gages, dies, jigs and fixtures.

ETROIT—Michigan Rivet Corp., 91 E. Milwaukee Ave., a manufacturing business, has been formed by K. M. Knuppenberg, 161 Lafayette, Romeo, Mich.

ETROIT—Rite Production Inc., 5237 12th St., has been incorporated by John F. Gatz as a machine shop and manufacturing business.

ETROIT—Klopp Engineering Inc., 5736 12th St., has been incorporated by Peter R. Klopp Sr., 858 Boston Blvd., to manufacture and sell coin-handling equipment and hand tools.

RAND RAPIDS, MICH.—Robert B. Mackey, 1157 Iroquois Dr., has formed Do-All Castings Inc., 529 Grand Rapids National Bank Bldg. This company will fabricate metals and manufacture products.

ANCOCK, MICH.—Portage Lake Machine & Mfg. Co., foundry and machine business, has been organized by Axel A. Koski, Royce Road, Ripley, Mich.

ORTHVILLE, MICH.—Rex-National Corp., 543 Dunlap, has been formed to manufacture plastics and metal products by John D. Scarbrough, 12861 Ward Ave., Wyandotte, Mich.

ORT HURON, MICH.—Worth Products Co., 4826 Lakeshore Rd., has been organized by Harvey E. Amoe, to deal in general foundry work.

FERROALLOYS

(*Continued from Page* 107)

undry Ferrochrome: (Cr 62-66%, C 5-7%). ntract, c.l., 8MxD, bulk 22.0c per lb of ntained Cr, c.l., packed 22.9c, ton 24.25c, s ton 26.0c. Delivered. Spot, add 0.25c.

w-Carbon Ferrochrome: (Cr 67-72%). Conct, carload, lump, bulk, max. 0.03% C .85c per lb of contained Cr, 0.04% C 29.75c, 06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carad packed add 1.1c, ton lot add 2.2c, less n add 3.9c. Delivered. Spot, add 0.25c.

M" Low-Carbon Ferrochrome: (Cr 62-66%, 4-6%, Mn 4-6%, C 0.75-1.25% max.). Conct, carload, lump, bulk 27.75c per lb of ntained chromium, carload, packed 28.85c, n lots 30.05c, less ton 31.85c. Delivered. ot, add 0.25c

w-Carbon Ferrochrome, Nitrogen Bearing: d 5c to 0.10% C low-carbon ferrochrome ces for approx. 0.75% N. Add 5c for each 5% of N above 0.75%.

romium Metal: (Min. 97% Cr and 1% Fe). ntract, carload, 1" x D; packed, max 0.50% grade, $1.03 per lb of contained chromium, n lot $1.05, less ton $1.07. Delivered. Spot, d 5c.

Silicon Alloys

30% Ferrosilicon: Contract, carload, lump, lk, 17.00c per lb of contained Si; packed 40c; ton lot 19.50c., f.o.b. Niagara Falls, Y., freight not exceeding St. Louis rate owed.

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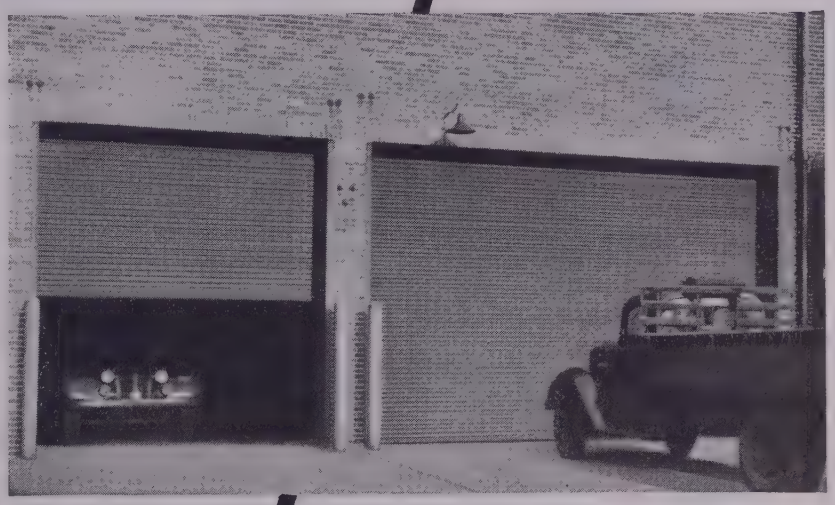

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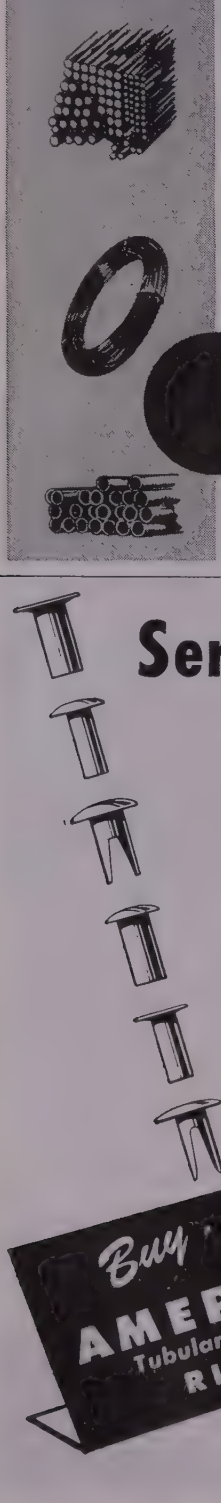

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50% Ferrosilicon: Contract, carload, lun bulk, 11.3c per lb of contained Si, carlo packed 12.9c, ton lot 14.35c, less ton 1 Delivered. Spot, add 0.45c.
Low-Aluminum 50% Ferrosilicon: (Al 0.4 max.) Add 1.3c to 50% ferrosilicon pric

75% Ferrosilicon: Contract, carload, lun bulk, 13.5c per lb of contained Si, carlo packed 14.8c, ton lot 15.95c, less ton 17. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lun bulk, 14.65-15.00c per lb of contained Si, c load packed 15.9c, ton lot 16.9c, less 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.5 max.). Add 0.7c to 85% ferrosilicon pric

90-95% Ferrosilicon: Contract, carload, lun bulk, 16.5c per lb of contained Si, carlo packed 17.7c, ton lot 18.65c, less ton 19. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.5 max.). Add 0.7c to above 90-95% ferrosili prices.

Silicon Metal: (Min. 97% Si and 1% ma Fe). C.l., lump, bulk, regular 19.0c per of Si, c.l. packed 20.2c, ton lot 21.1c, less 22.1c. Add 1.5c for max. 0.10% calci grade. Deduct 0.4c for max. 2% Fe gra analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% F Contract, basis f.o.b. Niagara Falls, N. lump, carload, bulk, 7.40c per lb of all ton lots packed 8.80c, 200 to 1999 lb 9.1 smaller lots 9.65c. Delivered. Spot up 0.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3% each and containing exactly 2 lb of Cr). Co tract, carload, bulk, 13.75c per lb of briqu carload packed 14.45c, ton lot 15.25c, less 16.15c. Delivered. Add 0.25c for notchi Spot, add 0.25c.

Ferromanganese Briquets: (Weighing appr 3 lb and containing exactly 2 lb of M Contract, carload, bulk 10.45c per lb briquet, c.l. packaged 11.25c, ton lot 12.0 less ton 12.45c. Delivered. Add 0.25c notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing appr 3½ lb and containing exactly 2 lb of Mn a approx. ½ lb of Si). Contract, c.l. bulk 10.3 per lb of briquet, c.l. packaged 11.1c, ton 11.9c, less ton 12.8c. Delivered. Add 0. for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing prox. 5 lb and containing exactly 2 lb of S Contract, carload, bulk 6.15c per lb of briqu c.l. packed 6.95c, ton lot 7.75c, less ton 8.6 Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and co taining exactly 1 lb of Si). Carload, b 6.30c, c.l. packed 7.10c, ton lots 7.90c, less 8.80c. Delivered. Add 0.25c for notching, sm size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb Mo. each) 95.00c per pound of Mo contain F.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, 14-18% and Si 53-59%. Contract, carlo lump, bulk 19.25c per lb of alloy, carl packed 20.05c, ton lot 21.55c, less ton 22.5 Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, 1.50-3%). Contract, carload, lump, bulk 17 per lb of alloy, carload packed 19.1c, ton 21.0c, less ton 22.5c. Delivered. Spot 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, 3.5% max., Si 4% max., C 0.10% ma Contract, ton lots 2" x D, $1.40 per lb contained Ti; less ton $1.45. (Ti 38-43%, 8% max., Si 4% max., C 0.10% max.) lot $1.28, less ton $1.35, f.o.b. Niagara Fa N. Y., freight allowed to St. Louis. Spot, 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, 6-8%). Contract $160 per net ton, f.o.b. agara Falls, N. Y., freight allowed to desti tion east of Mississippi river and north Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21% 3-4.5%. Contract, $175 per ton, f.o.b. N gara Falls, N. Y., freight not exceeding Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-Hearth Grade (Va 55%, Si 8-12% max., C 3-3.5% max.) C tract, any quantity, $2.90 per lb of contai Va. Delivered. Spot, add 10c. **Crucible-Spe**

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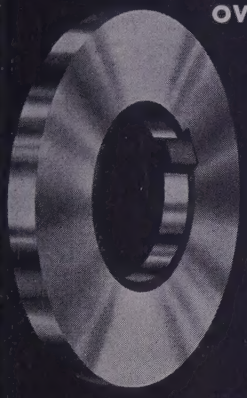

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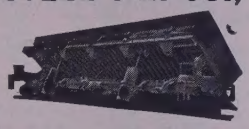

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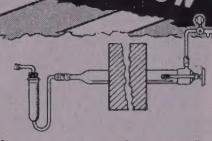

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Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed. 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb of alloy; ton lots 18.00c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); Gross tons per carload, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.10.

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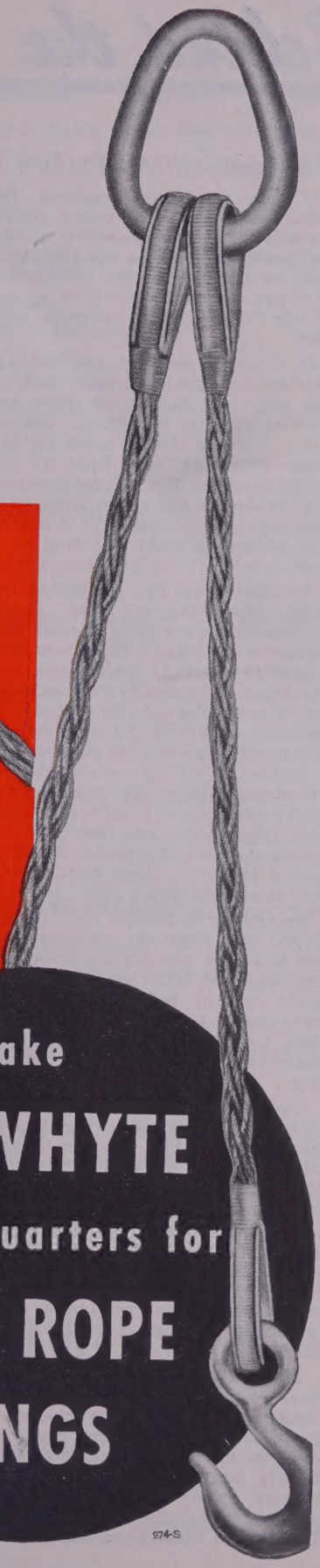

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Behind the Scenes...

Middle Age Is Where You Find It

If you've stopped running for trains and winters seem colder, you're not only getting along quite normally but you'll undoubtedly get the same kick we did out of this explanation of things in general as sent in by one of our "middle age" salesmen over east:

It seems to me they are building staircases steeper than they used to. The steps are higher, or there are more of them, or something. Maybe this is because it's so much farther today from the first floor to the second floor, but I've noticed it is getting harder to make two steps at a time any more. Nowadays it is getting harder to make one step at a time.

Another thing I've noticed is the small print they're using lately. Newspapers are getting farther and farther away when I hold them, and I have to squint to make them out. The other day I had to back halfway out of a telephone booth in order to read the number on the coin box. It is obviously ridiculous to suggest that a person of my age needs glasses, but the only other way I can find out what's going on is to have somebody read aloud to me, and that's not too satisfactory because people speak in such a low voice these days I can't hear them very well.

Everything is farther than it used to be. It's twice the distance from my home to the station now, and they've added a fair sized hill that I never noticed before. The trains leave sooner too. I've given up running for them because they start faster these days when I try to catch them.

You can't depend on timetables any more, and it's no use asking the conductor. I ask him a dozen times a trip if the next station is where I get off, and he always says it isn't. How can you trust a conductor like that? Usually I gather up my bundles and put on my hat and coat and stand in the aisle a couple of stops away, just to make sure I don't go past my destination. Sometimes I make doubly sure by getting off at the station ahead.

A lot of things are different lately. Barbers no longer hold up a mirror behind me when they've finished, so I can see the back of my head, and my wife has been taking care of the tickets lately when we go to the theater. They don't put the same material into clothes any more either. I've noticed that all my suits have a tendency to shrink, especially in certain places, such as around the waist or in the seat of the pants, and the laces they put in shoes nowadays are much harder to reach.

Even the weather is changing. It's getting colder in winter, and the summers are hotter than they used to be. I'd go away, if it weren't so far. Snow is heavier when I try to shovel it, and I have to put on rubbers whenever I go out, because rain today is wetter than the rain we used to get. Drafts are more severe, too. It must be the way they build windows now.

People are changing too. For one thing, they're younger than they used to be when I was their age. I went back recently to an alumni reunion at the college I graduated from in 1943—that is, 1933—I mean 1923—and I was shocked to see the mere tots they've admitted as students these days. The average of the freshman class couldn't have been more than seven, they seem to be more polite than in my time, though; several undergraduates called me "Sir" and one of them asked me if he could help me across the street.

On the other hand, people my own age are so much older than I am, I realize that my generation is approaching middle age (I define middle age roughly as the period between 21 and 110) but there is no excuse for my classmates tottering into a state of advanced senility. I ran into my old roommate at the bar and he'd changed so much that he didn't recognize me.

"You've put on a little weight, George," I said.

"It's this modern food," said George. "It seems to be more fattening."

"How about another Martini?" I said. "Have you noticed how much weaker the Martinis are these days?"

"Everything is different," said George. "Even the food you get, it's more fattening."

"How long since I've seen you, George?" I said. "It must be several years."

"I think the last time was right after election," said George.

"What election was that?"

George thought for a moment. "Coolidge," he said.

I ordered a couple more Martinis. "Have you noticed these Martinis are weaker than they used to be?" I said.

"It isn't like the good old days," said George. "Remember when we'd go down to the speakeasy and order some orange blossoms, and maybe *(If you're still with us, turn to page 140)*

(Editorial Index—page 55)

STEEL

Vol. 125—No. 23 December 5, 1949

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Editorial Staff on Contents Page